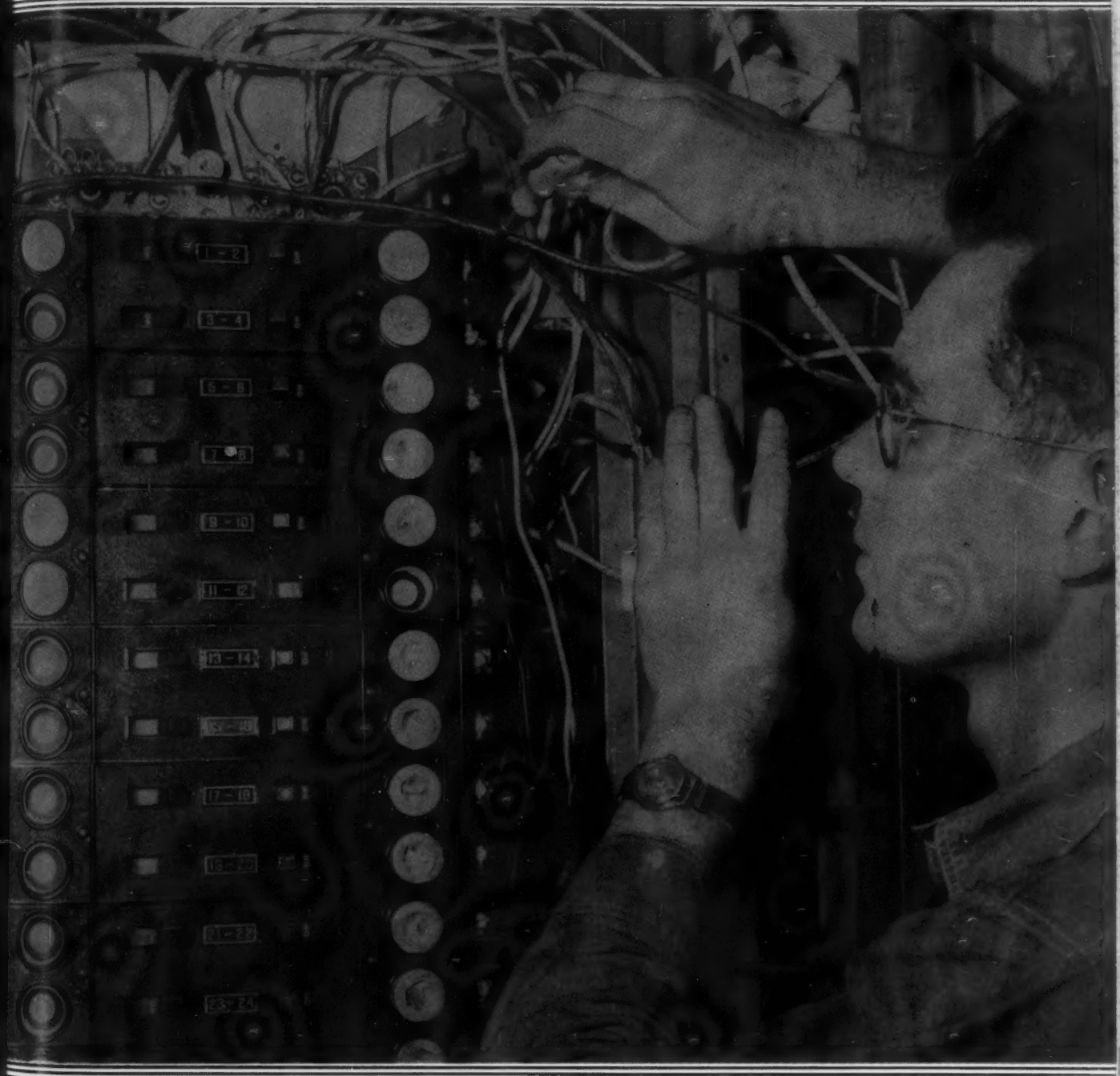
ELECTRICAL WEST

July, 1947
25 cents



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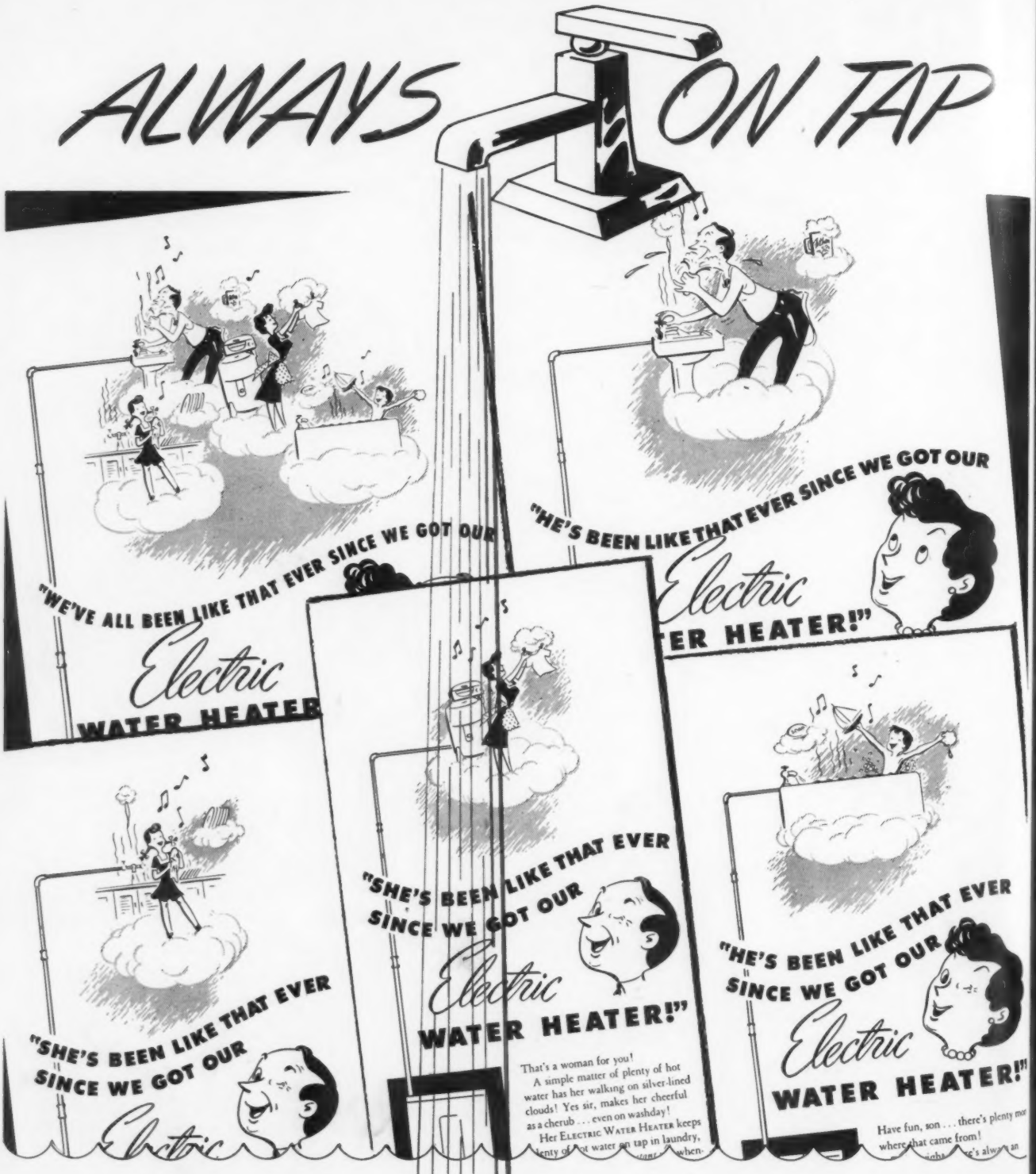
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

ALWAYS ON TAP


"WE'VE ALL BEEN LIKE THAT EVER SINCE WE GOT OUR
Electric
WATER HEATER
"HE'S BEEN LIKE THAT EVER SINCE WE GOT OUR
Electric
ER HEATER!"
"SHE'S BEEN LIKE THAT EVER SINCE WE GOT OUR
Electric
"SHE'S BEEN LIKE THAT EVER SINCE WE GOT OUR
Electric
WATER HEATER!"
That's a woman for you!
A simple matter of plenty of hot water has her walking on silver-lined clouds! Yes sir, makes her cheerful as a cherub . . . even on washday!
Her ELECTRIC WATER HEATER keeps
"HE'S BEEN LIKE THAT EVER SINCE WE GOT OUR
Electric
WATER HEATER!"
Have fun, son . . . there's plenty mo
where that came from!

EDISON PROMOTION OF ELECTRIC WATER HEATERS!

As part of an extensive promotion campaign, these newspaper ads *worked with* dealers during the past month to boost the sale of electric water heaters.

For almost fifty years, in Southern California Edison territory, a steady stream of similar advertising has helped to increase the flow of business to appliance dealers.

Southern Cali[illegible]n Company

what's new in GE street lighting

New insulator replaces Five designs

GENERAL ELECTRIC announces the new Form 45H7 wet-process porcelain insulator for series street-lighting luminaires. This improved insulator supersedes, and is interchangeable with, Forms 45H1, 45H3, 45H4, 45H5, and 45H6 designs.

You can now get this new insulator, and luminaires embodying it, at no increase in price. Current orders will be filled with insulators of the new design.

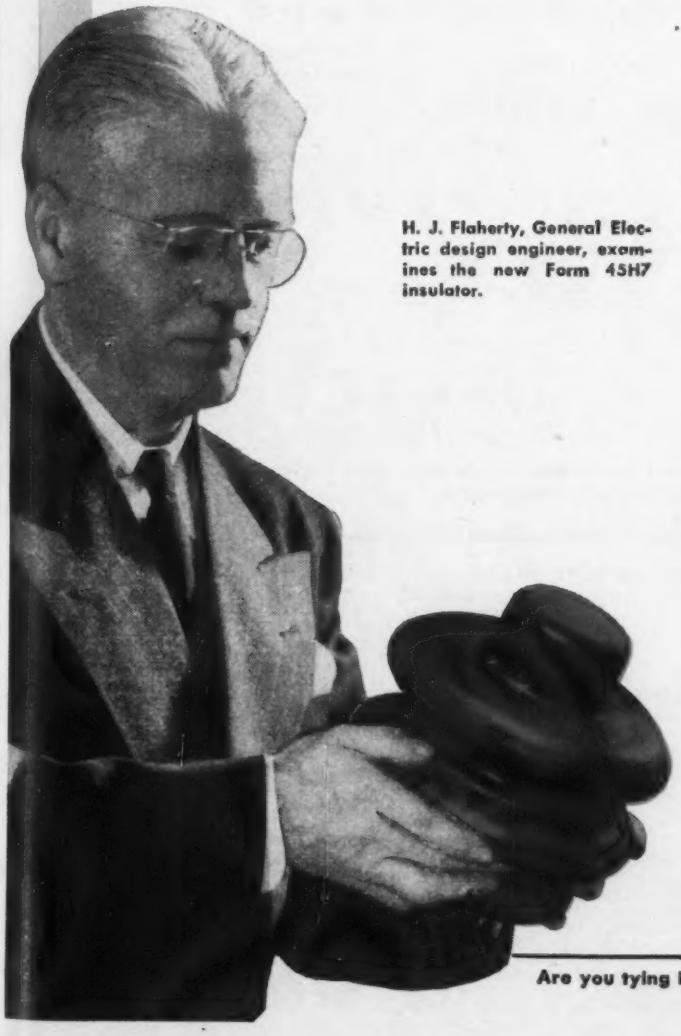
Features of the Form 45H7 Insulator

Among the improvements found in this new insulator are these:

1. Two "petticoats" instead of one lengthen the external creepage path and double the dry path under rain and sleet conditions.
2. A bottom bead has been added, strengthening the lip and preventing breakage.
3. Either internal or external wiring can be used. Terminal extensions, providing external binding posts, can be mounted in the lead openings when desired.
4. Light-center is accurately positioned by the socket receptacle, which is cemented into place. Dependable connections are assured.
5. Integral porcelain tie-lugs are provided in the lower "petticoat" to remove strain from terminals—less possibility of causing radio interference.

Standardized line of wet-process porcelain insulators

The new Form 45H7 is the insulator to use with high-voltage aerial wiring. With the Form 72, for duplex cable, General Electric's line of high-quality wet-process porcelain insulators is now reduced to two standard designs, which will meet all requirements—and which are suitable for all types of mounting and for any selection of reflectors or reflector-glassware combinations.



H. J. Flaherty, General Electric design engineer, examines the new Form 45H7 insulator.

GENERAL ELECTRIC

452-48

GOOD STREET LIGHTING BUILDS GOOD WILL

This improved insulator is another of General Electric's contributions to help you provide better street lighting at lower cost. For additional information call our nearest Apparatus Office or write to *General Electric Co., Schenectady 5, N. Y.*

Are you tying in with the NEMA plan to give America better street lighting?

JULY
1947

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents Copyright. Sixtieth year of publication.

ELECTRICAL WEST

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NEXT MONTH

To us boys from old Public School No. 1, private schools have always seemed pretty ritzy. Now it seems we'd better start getting used to them because every utility system seems to be running one. It looks like practically every lineman a few years hence is going to have a diploma from one of them.

About the fanciest campus of the bunch is Southern California Edison's, where they have built at least one each of practically every type of outdoor structure on the system. We've published some dope about it, and a picture of it in February.

Next month we'll give you another glimpse of what goes on in such schools with a report on the one run by Puget Sound Power & Light.

Wiring without gold-plating and some helpful ideas for wiring contractors will be contained in some notes on a major building rewiring job in San Francisco.

What 10,000 people a day saw of electrical appliance displays at the second annual Home Show in Los Angeles will be brought to you in pictures and terse reporting. What that newest dynamic dealers' association in the Inland Empire around Spokane found out about selling cost ratios should be pertinent to dealers throughout the West, and we hope to have that for you too. There'll be a Sales Guide on Electric Kitchens and the News Letter for your quick appraisal.

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Cover photo: Rewiring Veterans Administration Building, San Francisco. Photo by Veterans Administration.

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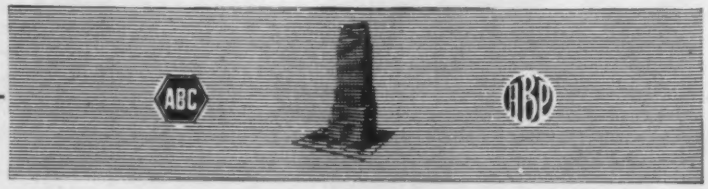

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NO. 1

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Cut-away of L-M Distribution Capacitor, showing the packs, heavy overlapped major insulation, discharge resistors, pack bracing, gasket construction and sealing.

Low Unit Stress*

designed and built into

L-M Distribution Capacitors

helps assure their long operating life

*Unit Stress: voltage stress per mil of thickness of insulation in the pack of a capacitor.

The theoretical life of a capacitor varies inversely as the fifth power of the unit stress. Therefore even relatively small changes in unit stress have a magnified effect on the life of a capacitor pack, because of this fifth power relation.

EXAMPLE—A pack with 10% lower unit stress than another will have a theoretically longer life by $(1.10)^5$ or 1.61. Thus, a pack operating at 10% lower unit stress will have a 61% longer theoretical life.

The only way to reduce the unit stress in a capacitor is to increase the pack volume. L-M Capacitors have a greater volume of pack per KVA because of additional insulation.

Therefore L-M Capacitors have the lowest unit stress, and will give more years of service.

And, by its unique method of enclosing the pack assembly, Line Material makes available a capacitor that offers these advantages of lowest unit stress and long life, and yet meets all the dimensional requirements of the industry.

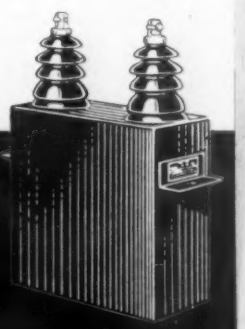
Individual Treatment PLUS Capillary Impregnation

Another important factor is the care in manufacture, and the *individual* treatment and *individual* testing of L-M Capacitors all along the line. Packs are wound in an air-conditioned, temperature and humidity-controlled room.

After the packs are placed in the steel cases, each capacitor assembly is *individually* and thoroughly dried under extremely high vacuum. Assemblies are then filled with "Elemex," (L-M's own dielectric liquid) by an exclusive capillary impregnation method. Careful sealing of units permanently precludes the entrance of air and moisture or the leakage of "Elemex."

Write for complete information about the many outstanding features of L-M Distribution Capacitors. Address Line Material Co., Milwaukee 1, Wisconsin.

SIZES... STANDARDS: L-M Capacitors are made in 15 Kva., 2400 to 13,800 volts; and 10 Kva., 2400 to 4160 volts. They meet EEI-NEMA standards.

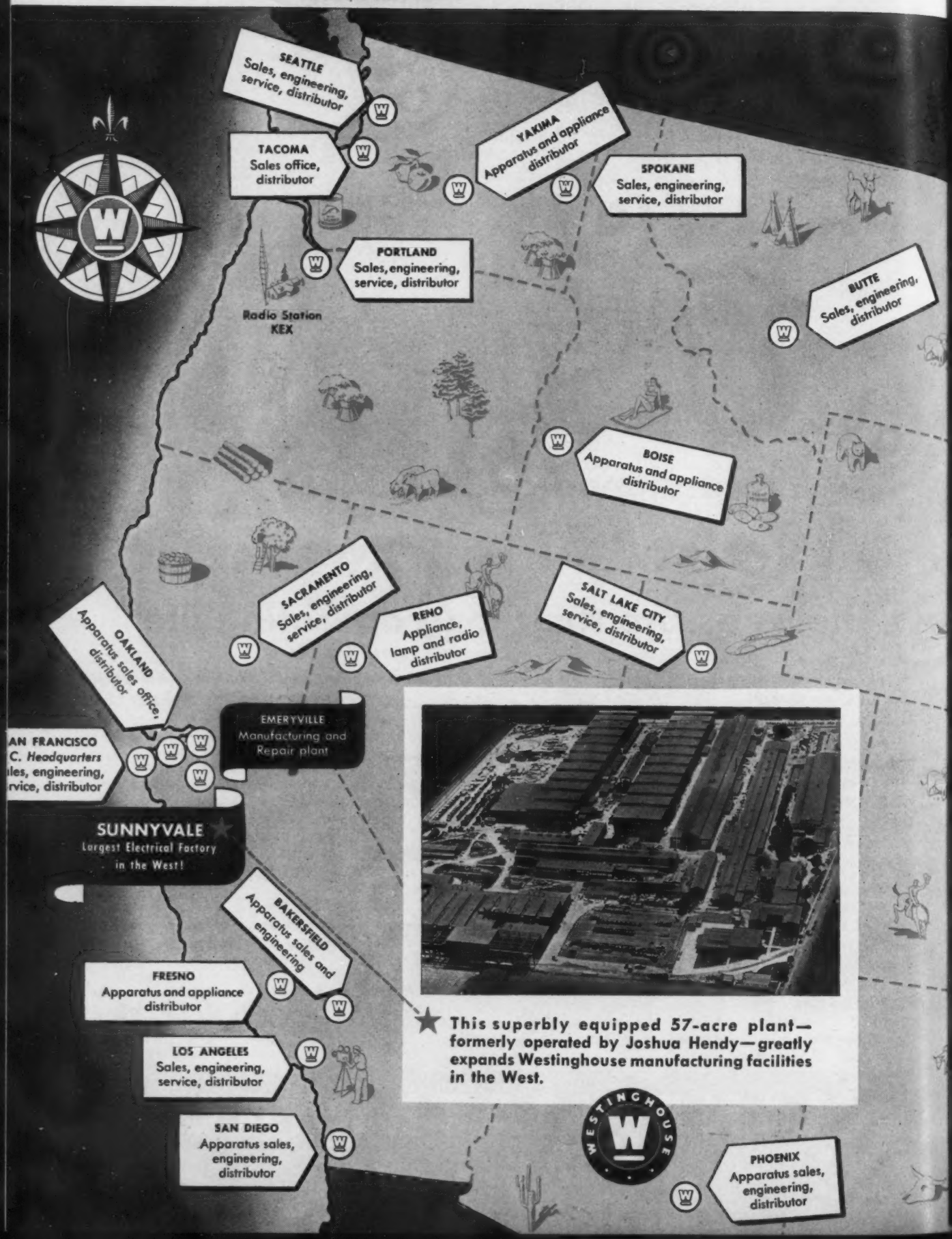


LINE MATERIAL

CAPACITORS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

THE *WEST* IN OUR NAME



★ **This superbly equipped 57-acre plant—formerly operated by Joshua Hendy—greatly expands Westinghouse manufacturing facilities in the West.**

AKES ON *NEW MEANING*

More Westinghouse products now

made in the west for the west

In recent years, the needs of western industry for electrical and steam equipment have increased tremendously. To keep pace with this demand, Westinghouse has greatly expanded its western manufacturing, sales and service facilities.

Now, in the recently acquired Joshua Hendy plant at Sunnyvale, California, more Westinghouse products will be made *in* the West *for* the West. This 57-acre plant affords the largest and best-equipped commercial electrical manufacturing and machine shop facilities on the Pacific Coast.

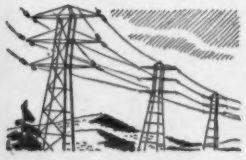
The wide range of industries to be served by these new Sunnyvale facilities—and by our Westinghouse plant at Emeryville, California—is suggested below. In addition, subcontract facilities are available for many types of precision machine work.

These large-scale manufacturing facilities, backed by the complete Westinghouse engineering and distributing organization, give the "West" in our name new meaning. We believe they'll contribute in many productive ways to meeting the growing needs of western industry. J-90577

Westinghouse

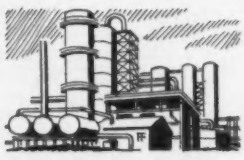
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

These expanded Sunnyvale facilities will enable Westinghouse to give better on-the-spot service to the West's many growing industries

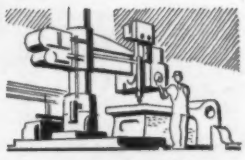


The Utility Industry

The Marine Industry

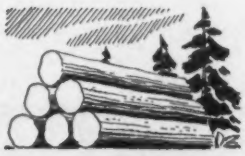


The Petroleum Industry



The Metal-working Industries

The Aviation Industry

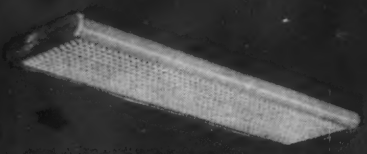


The Lumber Industry

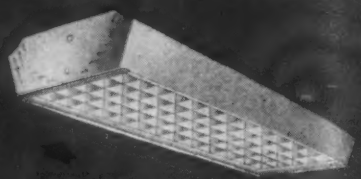
The Mining Industry

The Food Industry

Leader G-440 — A truly beautiful fixture, with excellent diffusion of light. Parabolic reflectors for maximum light output. Uses 4 40-watt lamps.



Leader "Officer" VL-440 — America's most modern fluprescent fixture. Architects and interior decorators choose "Officer" fixtures for distinction, beauty and for pleasing diffusion of light without sacrifice of putput. Uses 4 40-watt lamps.

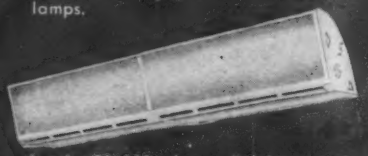


Leader URC Research Luminaire LRL-440 — Meets all specifications of Utility Research Commission for Better Light—Better Sight. Uses 4 40-watt lamps.

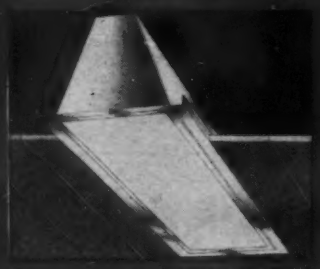
Leader Zephyrlite ZUO-240 — A favorite with those who know industrial lighting needs. Its excellent construction and many fine features make it the last word in efficient operation and easy maintenance. Built for 2 40-watt lamps.

KEEP A STEP AHEAD WITH

Leader

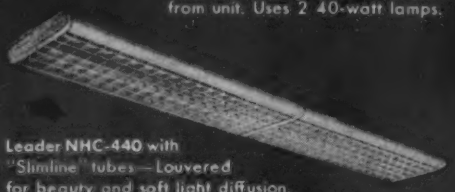


Leader GL-440 — Luxury lighting at moderate cost. With its deluxe features, prices compare with ordinary open type units. Hinged glass frame for easy maintenance. Requires 4 40-watt lamps.



Leader Trofferlite TG-240 — Ideal for use in remodeling or new streamlined construction. Strong rigid construction permits ceiling to be hung from unit. Uses 2 40-watt lamps.

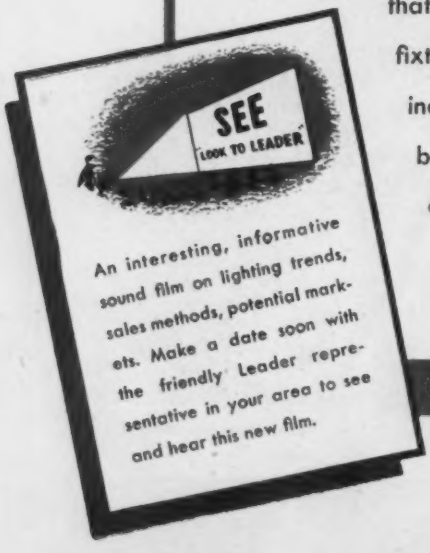
Leader Stratoliner IUO-240 — This sturdy fixture is the recognized leader in heavy duty industrial units. May be installed as single units or in continuous runs. Uses 2 40-watt lamps.



Leader NHC-440 with "Slimline" tubes—Louvered for beauty and soft light diffusion. Molded plastic side panels give maximum light transmission without glare. Uses 4 8-foot lamps.

Leader NHI-440 with "Slimline" tubes— This heavy duty unit has channels designed with grooves to take adjustable hanging clamp. Reflectors have captive knurled clasps. Uses 4 8-foot lamps.

THE Modern Design, Precision Engineering, and Controlled Manufacture that go into every Leader fluorescent fixture gives American business and industry lighting at its best. And, only better wholesalers and contractors distribute and install Leader fixtures.



An interesting, informative sound film on lighting trends, sales methods, potential markets. Make a date soon with the friendly Leader representative in your area to see and hear this new film.

Coming Soon! The Leader "Schoolmaster". A new type of fluorescent fixture especially designed for school room use. It's a "natural" for every school.

LEADER ELECTRIC COMPANY

6129 NORTH BROADWAY • CHICAGO 40, ILLINOIS

WEST COAST FACTORY • 2040 LIVINGSTON ST., OAKLAND 6, CALIF.

NEW Irvington Insulating Varnish WALL CHART

shows exactly the right varnish for insulating any winding

When selecting insulating varnish for any job, you'll find this handy wall chart an indispensable aid. Complete specifications and characteristics on all HARVEL and IRVINGTON varnishes are included. Just check your requirements against the property data and application information listed . . . and it's a simple matter to choose the best varnish to apply on new windings as well as for all maintenance needs.

Greatest Protection to Enamelled Wire

When you get the chart you'll see that each HARVEL and IRVINGTON baking varnish provides high dielectric strength . . . heat, moisture, and chemical resistance . . . and unusually favorable curing times. Equally important is the fact that each of these varnishes is formulated with Varnish Makers' and Painters' Naphtha – the mildest of petroleum solvents. This is your assurance that the enamel film on magnet wire is safe from attack and destruction caused by high solvency thinners.

Send for the Varnish Chart

Get your free copy of the varnish wall chart by returning the coupon today. Generous samples of any insulating varnish you select from it will be sent on request.

IRVINGTON

Varnish & Insulator Company

IRVINGTON 11, N. J.

IRVINGTON VARNISH & INSULATOR COMPANY
Irvington 11, New Jersey

Send me the new Insulating Varnish Wall Chart.

Name_____

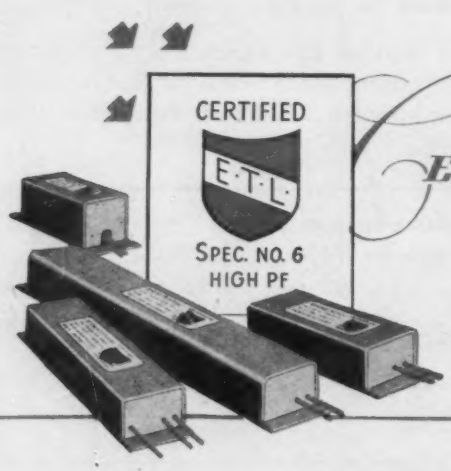
Address_____

CERTIFIED BALLASTS make the big difference!

Yes, there are still fluorescent lighting fixtures in use that have noisy ballasts. That steady hum is pretty distracting to anyone working near it. Thanks to properly installed CERTIFIED BALLASTS, *quiet* fixtures are much more the *rule* than the exception. And that's not the only benefit! CERTIFIED BALLASTS will not overheat . . . and they'll give you most light from the lamps, longer lamp life.

The "ETL CERTIFIED" shield on a ballast tells you instantly that the ballast has been made to exacting specifications for good operation. It has been tested, checked and CERTIFIED by famous Electrical Testing Laboratories, Inc. as meeting the specifications. Be sure, when specifying fluorescent lighting fixtures, that they have CERTIFIED BALLASTS—to get all the protection and advantages that you and your customers need and want!

CERTIFIED FLEUR-O-LIER fixtures, RLM STANDARDS INSTITUTE and CERTIFIED LAMP MAKERS (Portable Lamps) have solved their ballast problems by writing CERTIFIED BALLASTS into their specifications.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

Acme Electric Corporation
Cuba, New York

Chicago Transformer Div.
Essex Wire Corporation
3501 Addison St., Chicago, Illinois

General Electric Co.
Specialty Transformer Division
Fort Wayne, Ind.

Jefferson Electric Co.
Bellwood, Illinois

Sola Electric Co.
2525 Clybourn Avenue
Chicago 14, Illinois

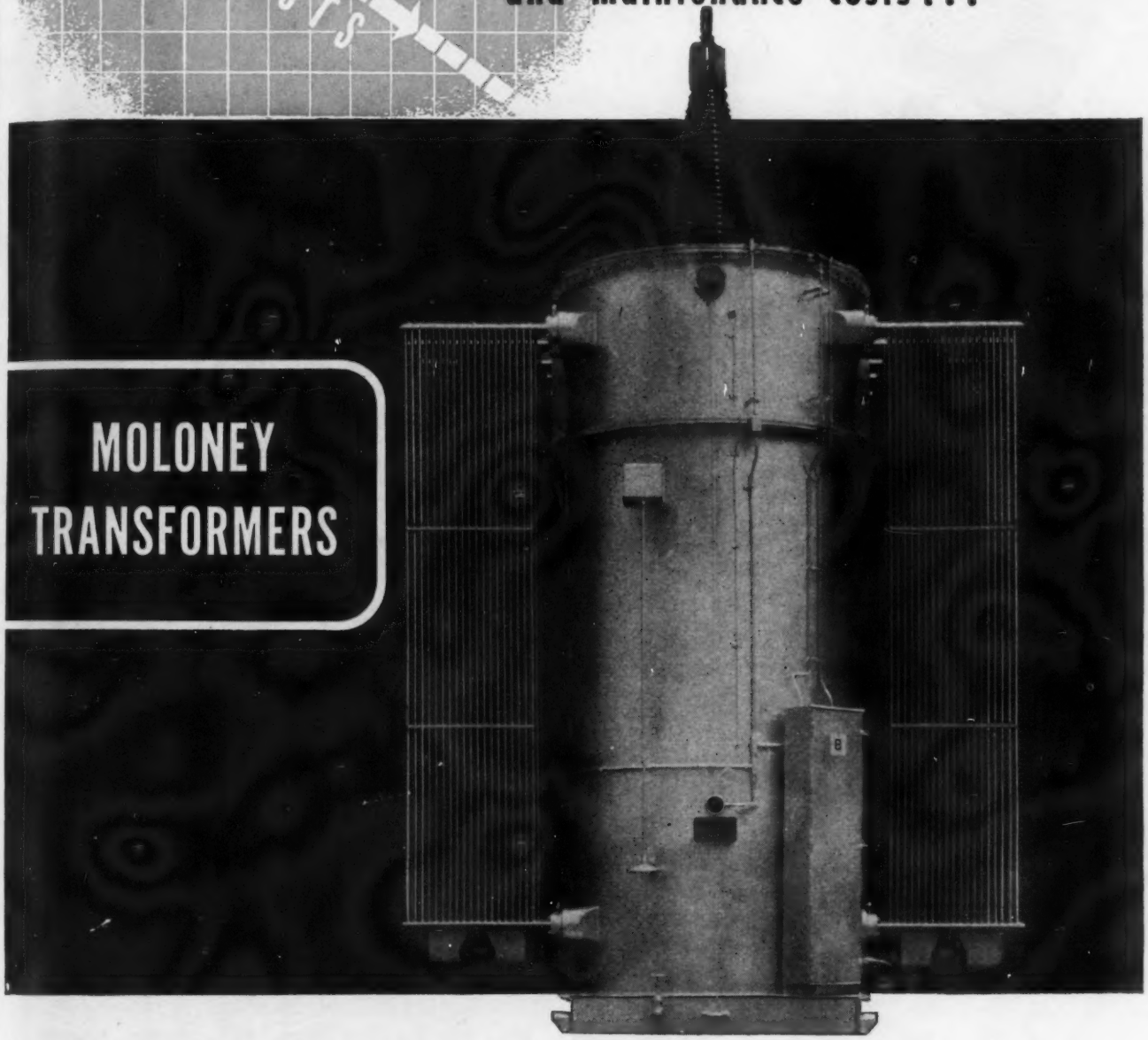
Starring and Company
Bridgeport, Conn.

Wheeler Insulated Wire Co., 378 Washington Ave., Bridgeport, Conn.

An Important Consideration

in the reduction of operating and maintenance costs . . .

COSTS



MOLONEY TRANSFORMERS

There is no doubt about it . . . the path to profit lies in reduction of maintenance and operating costs. For the industry as a whole this figure represents 15% of each revenue dollar. Moloney Transformers can help you cut these costs because of:

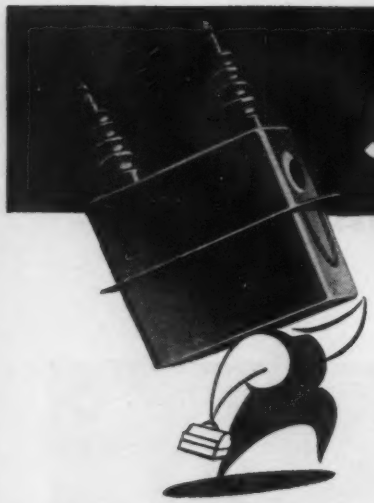
- Superiority of design that ensures high surge strength and thermal overload capacity.
- Better mechanical features which reduce maintenance operations.
- Long, trouble-free operation due to fabrication by skilled workmen, use of quality materials, and careful processing.

For PLUS PERFORMANCE specify Moloney Transformers.

. . . OVER 50 YEARS OF LEADERSHIP IN DESIGN, RESEARCH, ENGINEERING

MOLONEY ELECTRIC CO. ☆ ST. LOUIS 20, MO.

POWER AND DISTRIBUTION TRANSFORMERS EXCLUSIVELY SINCE 1896



JOHNNY CAPACITOR'S

SHORT-HAUL KILOVARS CUT YOUR INVESTMENT FOR KW TRANSPORT

KILOVAR ECONOMICS #3

Johnny says:

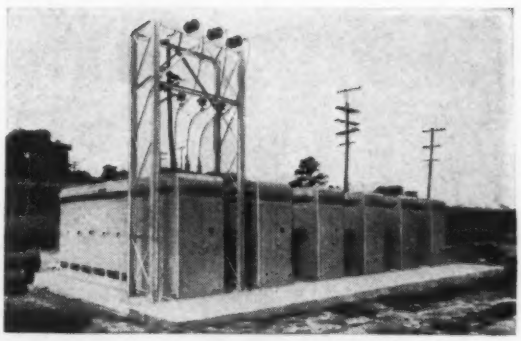
"Every kilovar that goes through your step-up transformers may come *down* THREE TIMES!"

Why use your "de luxe" transportation facilities to step *UP* and carry kilovars through your high tension lines, *DOWN* to your sub-transmission lines, *DOWN* to your distribution lines, and finally, *DOWN* to the point of consumption.

On-the-spot kilovar generation by capacitors rids your lines of transported kilovars. This makes room for increased kilowatt capacity—equivalent to as much as 20 per cent of your peak load*—and *effectively reduces transmission and distribution costs from the generator all the way out to the load.*

It's as simple as this

If the transmission and distribution lines and substations of your system are worth, say, $150 per kilowatt transmitted, why should kilovars which can be supplied at an installed cost of $10 each be using these valuable facilities?



A General Electric specialist will be glad to work with you on the application of capacitors to your system. For further information ask your G-E representative or write to *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

THESE SYSTEMS ARE NOW TAKING ADVANTAGE OF CAPACITORS TO CUT INVESTMENT COSTS

Here are the names of companies, typical of the industry, which are now using capacitors as an important economic tool: New Orleans Public Service Inc., with capacitors equal to 21 per cent of its peak load. Tampa Electric Company—20%; Oklahoma Gas and Electric Company—20%; Illinois Power Company—18%.

**Assumes 80% power factor operation.*

GENERAL ELECTRIC

407-114

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

RU wiring with **RU?** it's the coming "Code" wire

Some people are just different!

And the same goes for electrical wire. Laytex (Type RU) branch circuit wire stands out from the mob because it is the world's smallest diameter, lightest weight natural rubber-covered building wire.

The small diameter of Laytex permits more circuits per conduit. The 90% unmilled, grainless natural rubber insulation is applied in laminated walls that form an electrically safe sheath. The conductors are perfectly centered, eliminating chances of thin spots. Dielectric and tensile strengths are high.

Laytex (Type RU) is more than just different. In physical and electrical qualities, there is no other wire to compare with it.

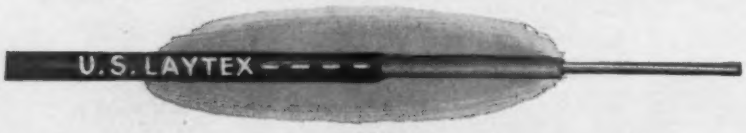
UNITED STATES RUBBER COMPANY
1230 Avenue of the Americas • Rockefeller Center • New York 20, N. Y.

SAFETY FACTORS THAT PUT RU OUT IN FRONT

BULL'S EYE
The conductor is on dead center throughout every inch of the wire.

ELEPHANT INSULATION
Laminated walls of natural rubber insulation mean Laytex (RU) is safe.

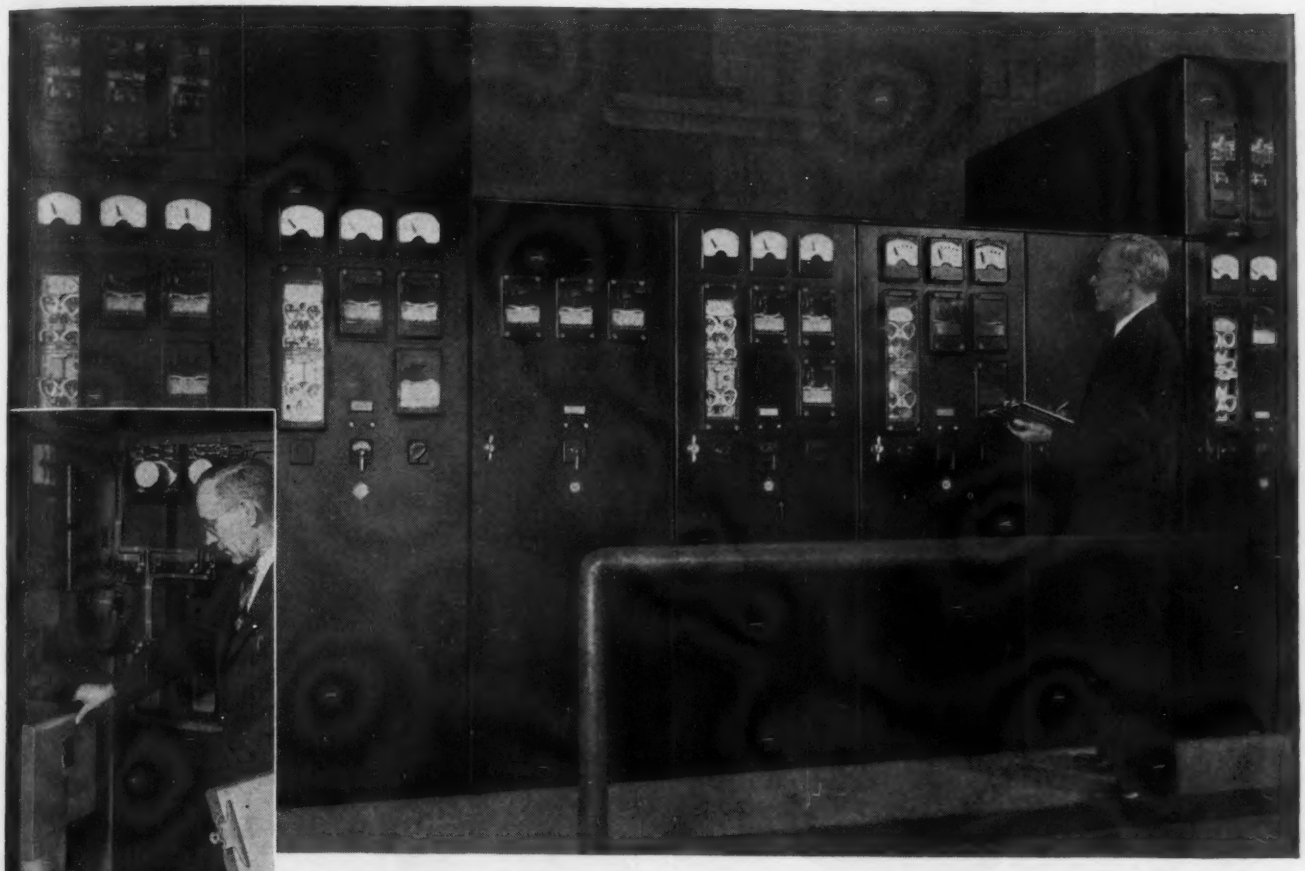
SMALLER O.D.
Allows more circuits per conduit than in ordinary wire. Lighter weight.



Specify RU **Laytex**

ELECTRICAL WIRES AND CABLES

RELIABLE METAL-CLAD SWITCHGEAR



Automatic disconnection of contacts, completely enclosed buses, mean safe and easy inspection of the breakers.

Pharmaceutical Firm Chooses "Ruptair" Circuit Breakers to Safeguard Electrical System

COMPLETELY RELIABLE electrical protection is *especially important* in manufacturing medical drugs. To get such protection, one of the nation's largest pharmaceutical firms brought its switchgear problem to A-C. The solution was *Ruptair* magnetic air circuit breakers integrated in Allis-Chalmers metal-clad switchgear. These units, with an interrupting capacity of 150,000 kva each, provide this plant with the complete electrical protection it requires.

* * * * *

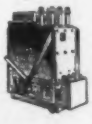
It was Allis-Chalmers who first introduced metal-clad switchgear to the U.S. Today, it is Allis-Chalmers who offers one of the world's most complete lines of metal-clad switchgear for all applications. Bring your problems to experts . . . call our nearest office or write: ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2274

Allis-Chalmers Builds all four Types of Circuit Breakers

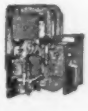
AIR BLAST available in interrupting capacities from 250,000 kva to 500,000 kva.

MAGNETIC AIR. A-C trademark *Ruptair*. Capacities: 50,000 to 250,000 kva.



OIL — A-C trademark *Ruptor*. Interrupting. Capacities: 50,000 to 500,000 kva.

LOW VOLTAGE—Metal enclosed dead front; 25,000-50,000 A. I. C., 600 v a-c max



ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

SHERARDUCT

Full weight, threaded rigid steel conduit.

"Sherardized" for enduring service.

XDUCT JUNIOR

Thin wall Electrical Metallic Tubing.

Electro-galvanized.

METAL MOLDING

3 sizes with the "lay-in" principle

Smooth, neat appearance.

IPI and IFB BUS

PLUG-IN and FEEDER BUS systems.

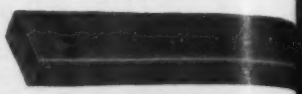
Just plug-in the loads.

PLUG-IN STRIP

Wired multi-outlet assembly

Outlets every 18"

For real convenience.



NEPCODUCT

Modern under-floor wiring system

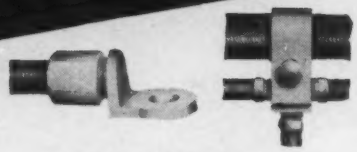
For power, light

and communication circuits.

Modern electrical systems for every requirement

ELECTRICAL WIRE AND CABLE

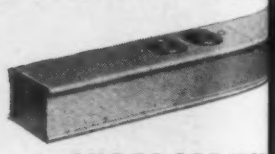
Bare, insulated, armored and sheathed wire and cable for every location and requirement. Complete line of boxes and fittings for all installations



GORILLA GRIPS

Precision connectors.

No special tools required.



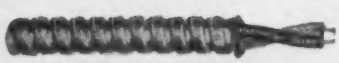
SURFACEDUCT

2 1/8" x 1 5/8" raceway for loads to 20 amp. *Lay-in the wires.*

Snap on the capping.

Since 1905, National Electric has been a leader in meeting the ever-changing demands of the Electrical Industry.

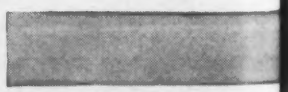
Today National Electric enjoys an enviable reputation as a trustworthy source of supply for complete wiring systems and fittings for every conceivable electrical requirement.



A.B.C. CABLE

Flexible steel armored bushed cable.

The bushing protects the wires.



FLORDUCT

Beveled, across-the-floor raceway

Withstands the bumps.

NATIONAL ELECTRIC PRODUCTS

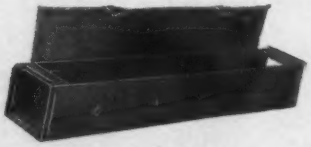
NE

WIRING SYSTEMS

WIRES AND CABLES

All N. E. products are approved by Underwriters' Laboratories

• Sold nationally through Electrical Wholesalers



WIREWA

Accessible 4 x 4 industrial wireway.

For circuits up to 600 volts.

LOOMWIRE

Non-metallic sheathed cable.

Complete line of Loomwire fittings and boxes available.

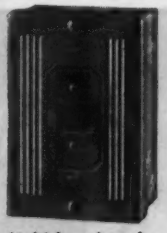
National Electric Products Corporation

Pittsburgh 30, Pa.

Wherever you need...
OVERCURRENT PROTECTION

You save time and money with Square D Circuit Breakers

Weatherproof, Dust-Tight and Explosion-Resisting Circuit Breakers.

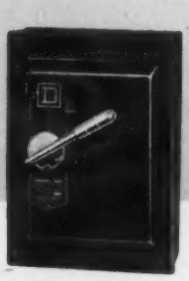


MO Multi-breaker for use on small machines.

Industrial Circuit Breakers in standard sheet steel enclosures.

Multi-breaker Load Centers for controlling and protecting lighting and small power circuits.

Rain-tight Multi-breakers with a variety of circuit arrangements.



Industrial Multi-breakers in capacities from 15 to 100 amperes, with 2 or 3 poles.

Multi-breaker Load Centers in Cast Iron Enclosures for Class 1, Group D and lower applications.

Multi-breaker Type M Load Centers with 50 ampere frame breakers for applications involving 120-240 volt AC circuits.

HERE'S HOW YOU SAVE TIME...

1 *Harmless momentary overloads pass without breaking the circuit, due to a time-lag feature built into every Square D Circuit Breaker.*

2 *Restoration of service is quick and easy. No replacing of fuses. A simple movement of the operating lever restores current after the cause of the short or overload has been eliminated.*

HERE'S HOW YOU SAVE MONEY...

1 *Fuses are eliminated—no replacement of parts is necessary.*

2 *Electrical equipment has constant proper protection, because every Square D Circuit Breaker unit is factory-sealed and consequently tamper-proof.*

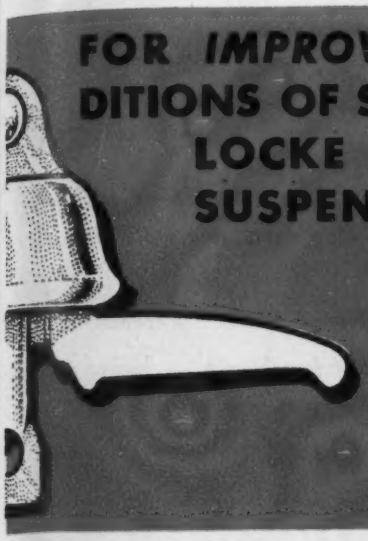
Square D makes exactly the Breaker you need

• Square D's *complete* line enables you to select exactly the right device for any given installation. A wide variety of enclosures, including general-purpose, raintight, dust-resisting, and explosion-resisting. Capacities range from 15 to 600 amperes, up to 600 volts. Send for INDUSTRIAL CIRCUIT BREAKER BULLETIN which illustrates and describes the complete line.

SQUARE D COMPANY

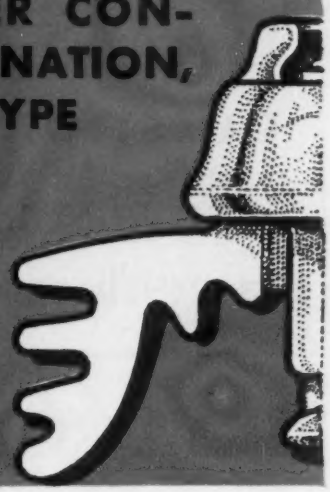
DETROIT • MILWAUKEE • LOS ANGELES

The New Locke
No. 18229
FOR IMPROVED PERFORMANCE...
The New Locke
No. 18212
Locke
FIRST IN CLAYRAMICS
INSULATORS and
SINCE 1893



FOR *IMPROVED PERFORMANCE* UNDER CONDITIONS OF SEVERE FOG AND CONTAMINATION, LOCKE OFFERS TWO NEW FOG-TYPE SUSPENSION INSULATORS....

In foggy or contaminated locations where driving, washing rains and winds occur, we suggest No. 18212 (or its companion with ball and socket hardware, No. 18219) illustrated at the left above. ● In locations where such winds and rains are not frequent, we offer No. 18229, or No. 18226 with clevis hardware.



Here are the merits of both designs . . .

12 INCH FLAT DISC TYPES

No. 18212 - Clevis and Tongue

No. 18219 - Ball and Socket

The smooth surfaces are easily cleaned by wind and rain.

Absence of deep corrugations and undercuts rids the unit of dirt traps.

The flat disc design provides ample space between units—even more than standard corrugated suspension units—for hot line maintenance work.

The unit (with its 12-inch diameter shell) provides plenty of clear arcing distance.

The units do not nest one in the other; thus there is large vertical drip distance from one unit to the next lower one. This minimizes the probability of flashover during rain.

The small corrugation on the under side acts as a barrier and tends to minimize ionized streamers that start at the pin.

Rugged shell construction with Compression Glaze reduces the danger of impact breakage to a minimum.

The leakage distance, 10¼ inches, is all open—thus simplifying natural and manual cleaning.

The larger diameter pin at the cement line reduces leakage current concentration at this point and minimizes the tendency to corrode or pit the pin.

10 INCH MULTI-SKIRT TYPES

No. 18226 - Clevis and Tongue

No. 18229 - Ball and Socket

The 10-inch shell diameter provides increased inside clearance for joining units together. This makes for easier maintenance—especially in hot line work.

The larger shell diameter provides more clear arcing distance from bottom of shell to cap of next lower unit.

The shell depth is less than other corrugated Fog types — providing more vertical drip distance between shells.

Outside corrugations have no undercut. This permits easier natural cleaning by wind and rain.

Additional *protected* leakage distance is provided by the vertical skirt inside the shell.

The small corrugation on the under side acts as a barrier and tends to minimize ionized streamers that start at the pin.

Total leakage distance is 18 inches, and is *balanced properly* with parallel arcing paths to use leakage distance most effectively.

Rugged porcelain construction with Compression Glaze reduces the chances of accidental or malicious breakage.

The larger diameter pin at the cement line reduces leakage current concentration at this point and minimizes the tendency to corrode or pit the pin.

POLE LINE HARDWARE

LOCKE INSULATOR CORP., BALTIMORE, MD.

● FOR MORE DETAILS ON THESE TWO NEW INSULATORS, WRITE FOR DESCRIPTIVE CIRCULAR JUST OFF THE PRESS.

QUESTION BOX ON OKOSHEATH non-metallic underground cable

Q. What are the principal advantages of non-metallic underground cable?

A. *They are less costly, light in weight, not damaged by chemical corrosion or electrolysis.*

Q. Which is the simplest type of non-metallic cable?

A. *Okosheath—which has but a simple mold-cured covering of high-tensile-strength, moisture-resistant rubber compound that provides both electrical and mechanical protection.*

Q. Is this desirable?

A. *Yes, indeed, because there are no fibrous coverings to rot, no saturants to clog ducts, and you'll find Okosheath a cinch to splice.*

Q. Can Okosheath be buried direct in a trench?

A. *Certainly—millions of feet have been giving failure-free service for nearly 20 years under these conditions.*

Q. What about service range?

A. *Okosheath is made in all sizes—can be used up to 2000 volts for a.c. networks, power distribution, underground entrances, signaling and control—in ducts or buried direct. It can be also supplied with an oil-resisting bonded Okoprene outer jacket made with neoprene.*

Q. Where can I find out more about Okosheath?

A. *Ask your Okonite representative or write direct to The Okonite Company, Passaic, New Jersey.*

CABLE PROTECTION in its simplest form

HEADQUARTERS FOR ANSWERS

OKONITE

OKONITE SINCE 1878

5089

Measured DEMAND

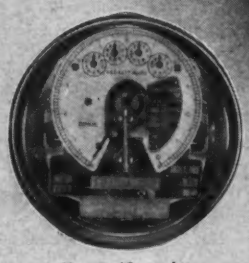
CAN HELP IMPROVE LOAD FACTOR

Type LC-2P with LG Demand Register.

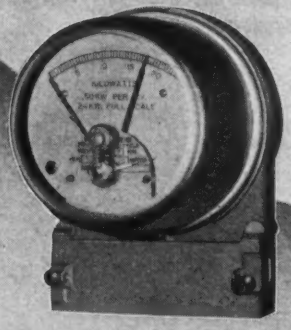
Sangamo Type LC-2P [illegible] Type LG Demand Register provides for measurement of kilowatt hours and kilowatt demand where a simple and compact unit is required.

SANGAMO
DEMAND INSTRUMENTS

BETTER load factors are the key to lower average power costs. Improvement can best be realized if the rate structure is such that the customer will be induced to lower his own average kilowatt hour cost through longer hours of use of his equipment. A low price for kilowatt hours which is made possible through a measured demand charge encourages longer hours use. The Sangamo JG and LG Demand Registers are applicable to watthour meters both for singlephase and polyphase. They provide an inexpensive and accurate method of measuring Kilowatt Demand. An extensive line of Sangamo Demand Instruments is available for your particular needs.



Type JS with JG Demand Register.



Type WDP, 4-Wire Delta.

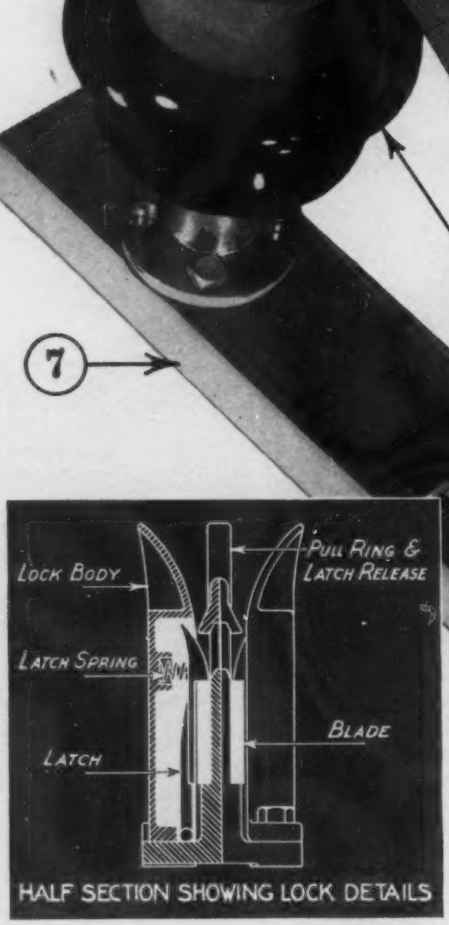
Sangamo Type JS Meter with JG Demand Register for measurement of singlephase kilowatt hours and kilowatt demand. Sangamo Lincoln-Type WDP, separate meter to measure kilowatt demand on polyphase circuit.

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD • ILLINOIS

OUTDOOR HOOK STICK OPERATED DISCONNECTS

Are built to operate efficiently under all conditions of service

1. Trussed type DOUBLE BLADE construction heavily reinforced.
2. Solid cast copper clips.
3. Wide flaring guide clips.
4. Terminal pads with Nema standard or special drilling.
5. Rugged spreader type locking device. (See detail illustration).
6. Nema standard insulators. (Station Posts can be used also).
7. Rigid base to prevent misalignment.



HALF SECTION SHOWING LOCK DETAILS

Hook stick operated Disconnects are built for all standard voltage ratings 7.5 KV to 161 KV.

SEND FOR BULLETIN 324

ELECTRICAL ENGINEERS EQUIPMENT CO.
MELROSE PARK ILLINOIS

Why shut down to move one machine?

DO YOU reach for red ink when machines must be moved? Do you watch production take a dive because a whole line must be shut down to tap in one machine? And do you wince at the cost of rewiring to change a shop set-up?

Then check with BullDog BUStribution DUCT for plug-in power that covers your whole plant.

Every ten-foot section of this modern electrical feeder system has ten convenient outlets. When a machine is moved the electrician need only raise the plug to the nearest outlet, snap its contact fingers over the bus bars and bolt the plug to the casing. He can do the whole job in twelve minutes or less.

A single machine, or a dozen, can be relocated with no delays for new wiring . . . no interruption of power for the rest of the line.

Built in standardized, prefabricated sections, BullDog BUStribution DUCT can be dismantled, moved and re-installed in new locations or combinations without scrapping a single bolt.

Call your nearby BullDog Field Engineer for full information on this flexible, economical power system, or write BullDog direct for descriptive folders.

ADEQUATE WIRING SERVES AND SAVES

BULLDOG

ELECTRIC PRODUCTS COMPANY

BullDog manufactures Vacu-Break Safety Switches — SafToFuse Panelboards — Superba and Rocker Type Lighting Panels — Switchboards — Circuit Master Breakers — "Lo-X" Feeder BUStribution DUCT — "Plug-in" Type BUStribution DUCT—Universal Trol-E-Duct for flexible lighting—Industrial Trol-E-Duct for portable tools, cranes, hoists.

DETROIT 32, MICHIGAN. FIELD OFFICES IN ALL PRINCIPAL CITIES. IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO.

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co.
1720 N. E. Sixth Avenue Tel. Garfield 2844
Portland, Oregon

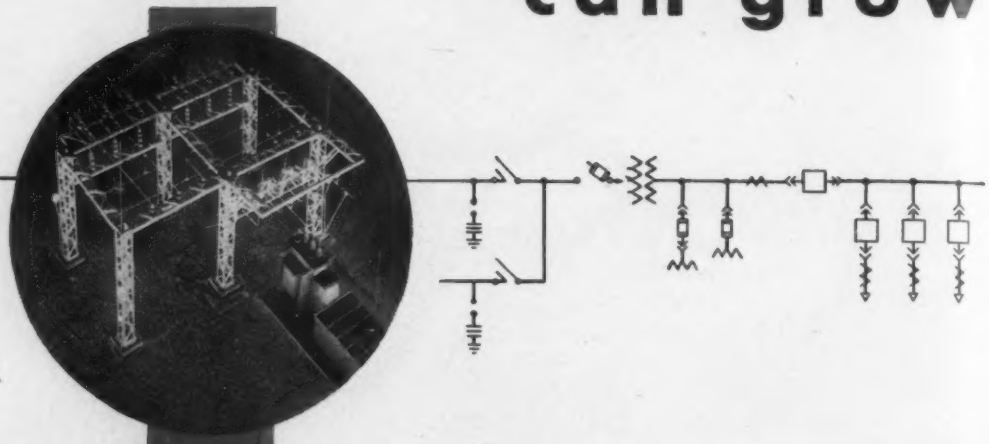
Safety Switchboard Company
1445 Stevenson St. Tel. Hemlock 2470
San Francisco, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
Los Angeles, Calif.

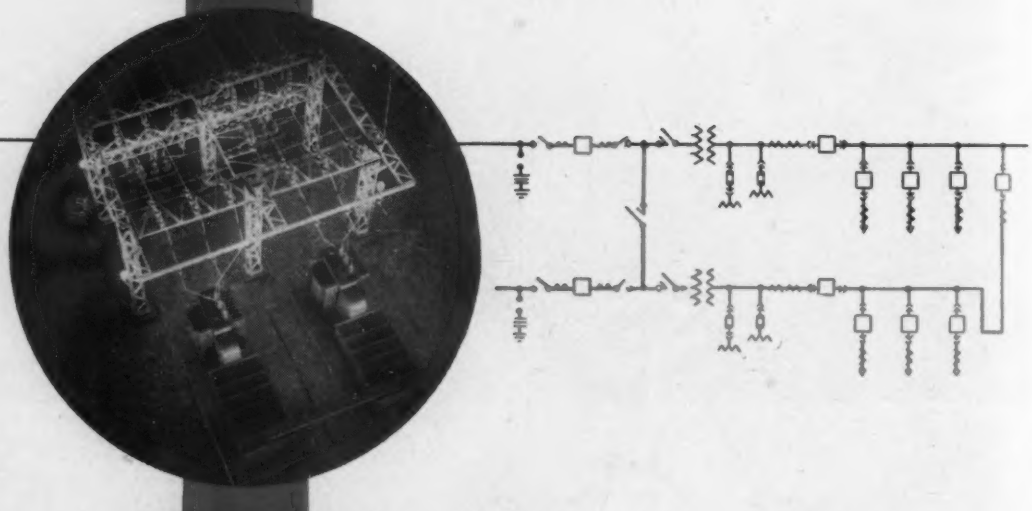
THE NEW GE PACKAGE

can grow

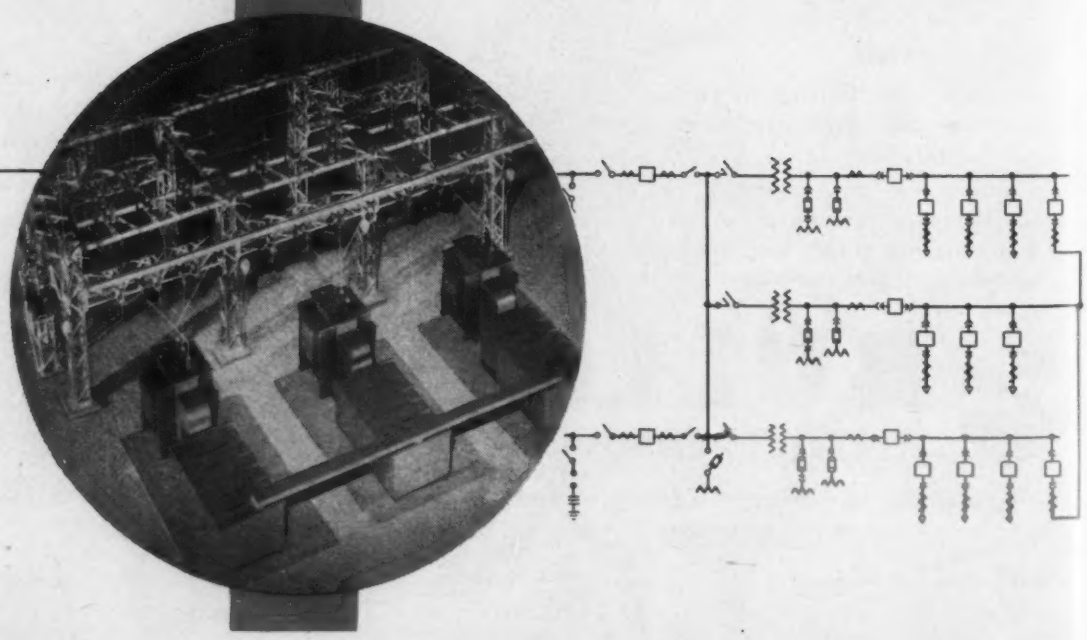
1947



1950



1952



SUBSTATIONS

with your load

The new package substations give a valuable flexibility to operators who must supply today's growing loads and prepare for tomorrow's.

This flexibility—illustrated at the left—is achieved by forward-looking designs that provide substation capacity in easily installed, easily moved "blocks of power." It enables you to:

1. **Be ready for expected—or unexpected—load growth or load shifts.**

Addition or re-location of package substation capacity is quick, easy and economical. There is no costly modification or rearrangement of installed equipment. The same flexibility enables you to remove capacity just as readily, to follow a shifting load.

2. **Reduce your system investment by more closely matching your installed substation capacity with changing loads.**

Cost comparisons and operating experience show that the "building block approach" of the new package substations can materially lower your system costs. Easy, economical installation of relatively small "blocks of power" enable you to make your installed substation capacity follow your load in small economical steps (right).

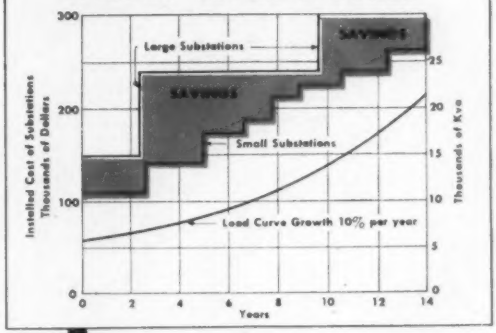
This on-the-job economy is but one of the package substation savings. Because you can select a *complete* substation as a unit, you save weeks of costly detailed planning right at the start. You go directly from the job to be done to the complete substation for the job. You need prepare but one *specification*, place but one *order*.

A helpful, 78-page bulletin, GEA-4500, describes 30 standard classes of package substations, gives you helpful application information on each, and shows just how each will look installed. If you do not have a copy, your General Electric sales representative will be glad to provide one, and work with you on any application you are considering. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

The chart below assumes an accurate load-growth prediction—which is seldom found in practice. If load growth is erratic, the savings will usually be even greater than shown.

The practice of meeting load growth with relatively small "blocks of power" also insures against excessive unused capacity in event of an unpredicted drop in load. Then, any unused capacity that has been added in small "blocks" can readily be moved to meet load growth in another area.

HOW YOU SAVE BY ADDING CAPACITY IN SMALL "BLOCKS OF POWER"



SAVINGS ON SUBSTATIONS

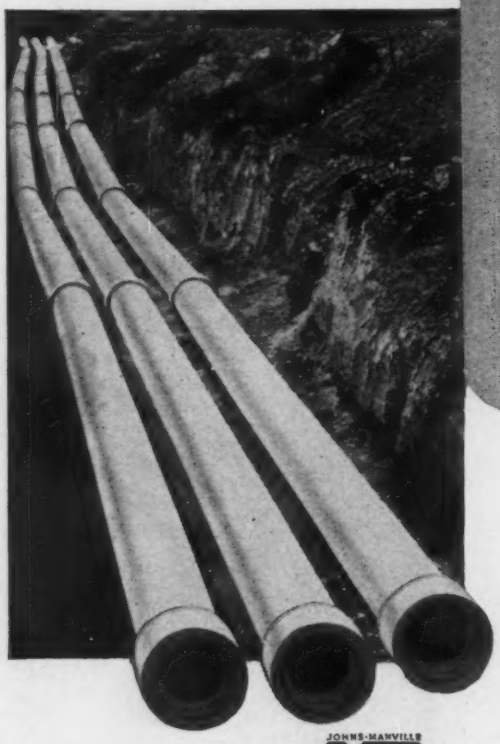
(Total annual charges at 12%)

Using large substation of fixed capacity	$434,000
Using package substations with "building block" approach	$330,000
Savings	$104,000

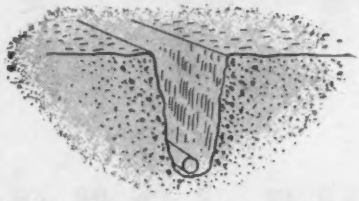
GENERAL ELECTRIC

321-54-5900

Do you know these facts about TRANSITE DUCTS?

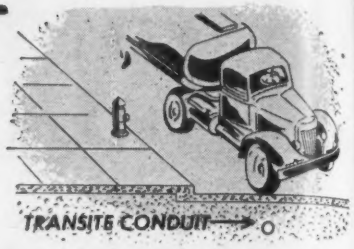


TRANSITE CONDUIT

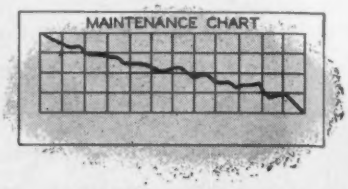


This durable duct is for use underground, or on exposed locations without a protective casing . . .

Transite Conduit effectively resists weather, smoke and fumes . . . is virtually unaffected by corrosive soils . . .

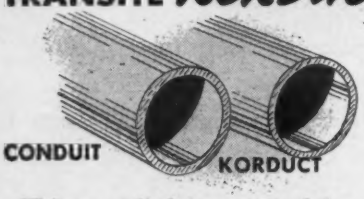


Under sustained earth loads and traffic pressure, it maintains its strength and true form . . .

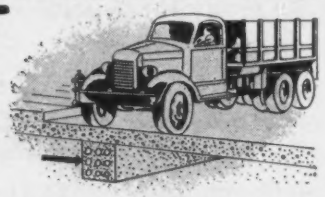


Its cost is low and, in service, it is much more economical than other materials of comparable strength and durability.

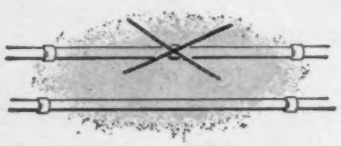
TRANSITE KORDUCT



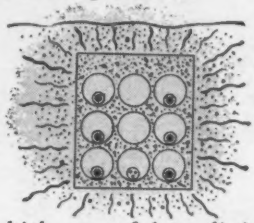
Thinner walled, lower priced than Transite Conduit, Transite Korduct is for use where an encasement is specified . . .



Because Korduct is incombustible, less concrete is required between ducts to provide the necessary degree of fire protection.



Its long lengths (10 feet) mean fewer joints, reducing the number of spacers required . . .



Its high rate of heat dissipation lowers cable operating temperatures . . . increases system capacity . . .

. . . *In addition*, both Transite Conduit and Transite Korduct have these characteristics:

1. INCOMBUSTIBLE—made of asbestos and cement, they cannot burn . . . will not contribute to the formation of dangerous smoke, fumes or gases.

2. IMMUNE TO ELECTROLYSIS—Transite Ducts are nonmetallic and inorganic . . . unaffected by electrolysis.

3. SMOOTH BORE—Making cable pulls easier, both at initial installation and after years of service.

4. EASILY INSTALLED—Lining up is fast and accurate because Transite Ducts combine lightweight, long lengths, simple assembly.

For details and specifications, write for Data Book DS-410, Johns-Manville, Box 290, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE DUCTS

TRANSITE KORDUCT—for installation in concrete

TRANSITE CONDUIT—for exposed work and installation underground without a concrete encasement

FWD THE TRUCK THAT GOES THRU WITH EQUIPMENT AND CREW

on the Highway or Cross-Country!

FWD... the public utility truck that "leads through to the job" . . . can be depended upon to get equipment and crew on location, fast, but safely, ready to do more work! On or off the highway, rugged FWDs have what it takes in power and traction to meet every demand in line-construction or maintenance emergency work. More than 150 utilities (some of them operating fleets of 200 or more FWDs) rely on these dependable four-wheel-drive trucks for all-year-'round service.

See the nearest FWD Distributor, or write for data.

THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wis.

Canadian Factory: KITCHENER, ONTARIO

NATIONAL DISTRIBUTORS—GRAYBAR ELECTRIC COMPANY

REGIONAL AND SERVICE: Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21 and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan; OREGON—Feenaughty Machinery Co., 112 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2; Glenn Carrington & Co., 91 Columbia St., Seattle, and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage, and The Graybar Electric Co., in over 90 principal cities.

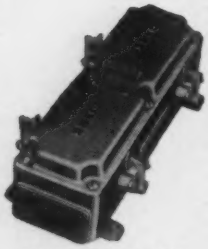
America's Foremost Heavy-Duty Truck

CROUSE-HINDS

Panelboards and Distribution Centers

The illustrations show a representative selection from the dozens of different CROUSE-HINDS Panelboards — each designed for its own purpose.

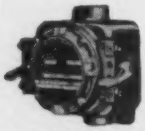
CROUSE-HINDS "complete line" means much more than just a range of sizes — there is a wide variety of highly specialized types in each product classification.



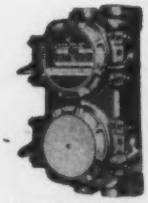
Type YSW Vaportight and Raintight Condulet with Four Single-Pole Circuit Breakers

Type DVSP Dust-Tight Vaportight and Raintight Condulet with Three Double-Pole Circuit Breakers

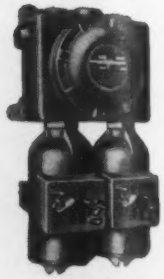
Type DVSP Dust-Tight Vaportight and Raintight Condulet with Two Single-Pole Circuit Breakers



Type GUSC Explosion-Proof Dust-Tight and Raintight Condulet with Two Single-Pole Circuit Breakers



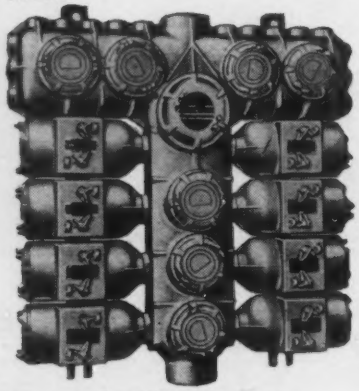
Type GUSC Explosion-Proof Dust-Tight and Raintight Condulet with Four Single-Pole Circuit Breakers



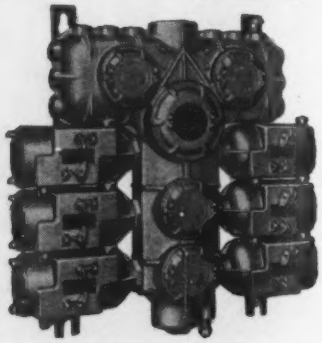
Type ESP Explosion-Proof Dust-Tight and Raintight Panelboard with Four Single-Pole Circuit Breakers

Type DVP Dust-Tight Vaportight and Raintight Panelboard with Sixteen Single-Pole Circuit Breakers

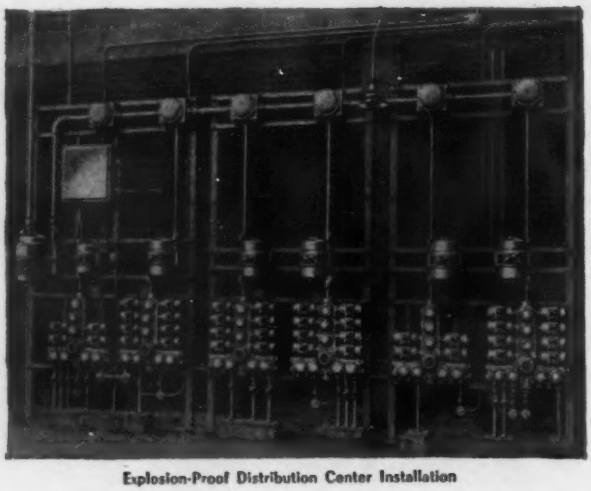
Type DVSP Dust-Tight Vaportight and Raintight Condulet with Six Single-Pole Circuit Breakers



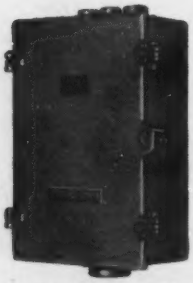
Type EDP Explosion-Proof Dust-Tight and Raintight Panelboard with Sixteen Single-Pole Circuit Breakers



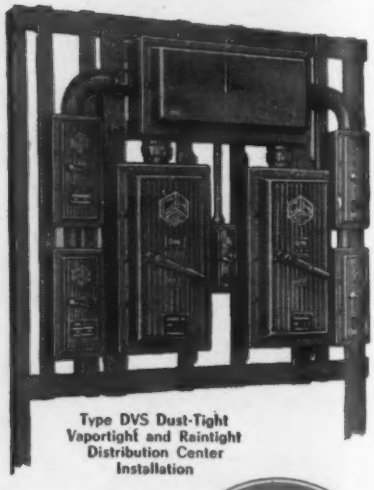
Type EDP Explosion-Proof Dust-Tight and Raintight Panelboard with Drains and Breathers and Twelve Single-Pole Circuit Breakers



Explosion-Proof Distribution Center Installation



Type WBP Raintight Panelboard with Nine Single-Pole Circuit Breakers Can Be Padlocked



Type DVS Dust-Tight Vaportight and Raintight Distribution Center Installation

A Nationwide Distribution Through Electrical Wholesalers

Complete listings of each type are in Condulet Catalog No. 2500.

Our 50th Anniversary
1897 — 1947

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

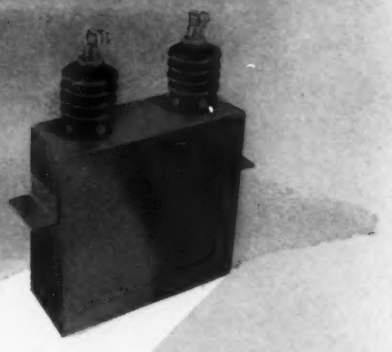
Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee — Minneapolis — New York — Philadelphia — Pittsburgh — Portland, Ore. — San Francisco — Seattle — St. Louis — Washington. *Resident Representatives:* Albany — Atlanta — Charlotte — New Orleans
CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

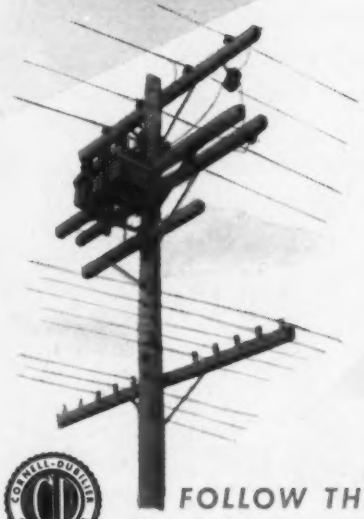
CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

Field Tested/Not for one year–but for 10 years!

CORNELL-DUBILIER

CAPACITORS





The reason why six out of every ten capacitors are C-D's lies in better performance and dependability. For proof of the dependability of field-proven C-D capacitors we refer you to the over 3,000 major installations using C-D's. You pay no more for the best. Next time specify C-D's. Our engineers will gladly consult with you as to the practicability of C-D's as applied to your system requirements. Cornell-Dubilier Electric Corporation, Dept. C7, South Plainfield, New Jersey. Other plants in New Bedford, Worcester and Brookline, Mass., and Providence, R. I.

FOLLOW THE LEADERS

DEMAND DEPENDABLE C-D CAPACITORS FOR YOUR SYSTEM

CORNELL-DUBILIER • ***WORLD'S LARGEST MANUFACTURER OF CAPACITORS***

because you wanted it.

All Simplex - ANHYDREX Underground Cables now have a neoprene jacket and they have it because you asked for it.

For you, a neoprene jacket on ANHYDREX cables means that you can use the cables underground with or without ducts, or you can run them up poles, or you can string them from messenger wire without having to stock a number of different kinds of cable. Neoprene jackets or sheaths aren't seriously affected by sunlight, by ozone, by heat or flame. They have excellent abrasion resistance and are oil resistant.

If you want to know more about the fine qualities of Simplex - ANHYDREX Underground Cables, we will be glad to send you a copy of the new edition of the ANHYDREX Underground Cable book, dated April, 1947. Write for Bulletin 985-A.

Simplex **WIRES & CABLES**

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

How many jobs can you do *Faster, Easier, Cheaper* with INFRARED HEAT?

CHECK THIS LIST

Instruments: Baking wrinkle finishes —infrared oven increased production 200%.

Metal chairs: Conveyorized degreasing with infrared lamps saves two men's time.

Signs: Infrared speeds spraying and drying, cuts cost 40%.

Clocks: Drying lacquer with infrared heat gives 85% saving over previous method.

And in hundreds of other applications Westinghouse infrared heat lamps can—and do—cut costs, speed production, and make processes easier.

SEND FOR FREE BOOKLET

To explore the opportunities offered by infrared heating, write for "Industrial Infrared Lamps," Form A-3817. This 12-page booklet is a complete guide to process and product. Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

Westinghouse *Lamps*

Westinghouse Lamp District Offices:
1299 Northside Drive, NW, ATLANTA; 10 High St., BOSTON; 20 N. Wacker Drive, CHICAGO; 40 Wall St., NEW YORK; 3001 Walnut St., PHILADELPHIA; 32 Blvd. of Allies, PITTSBURGH; 1 Montgomery St., SAN FRANCISCO; 411 N. 7th St., ST. LOUIS.

Westinghouse Electric Corporation
Lamp Division, Bloomfield, New Jersey

Please send me your illustrated booklet—"Industrial Infrared Lamps," Form A-3817.

Name .....

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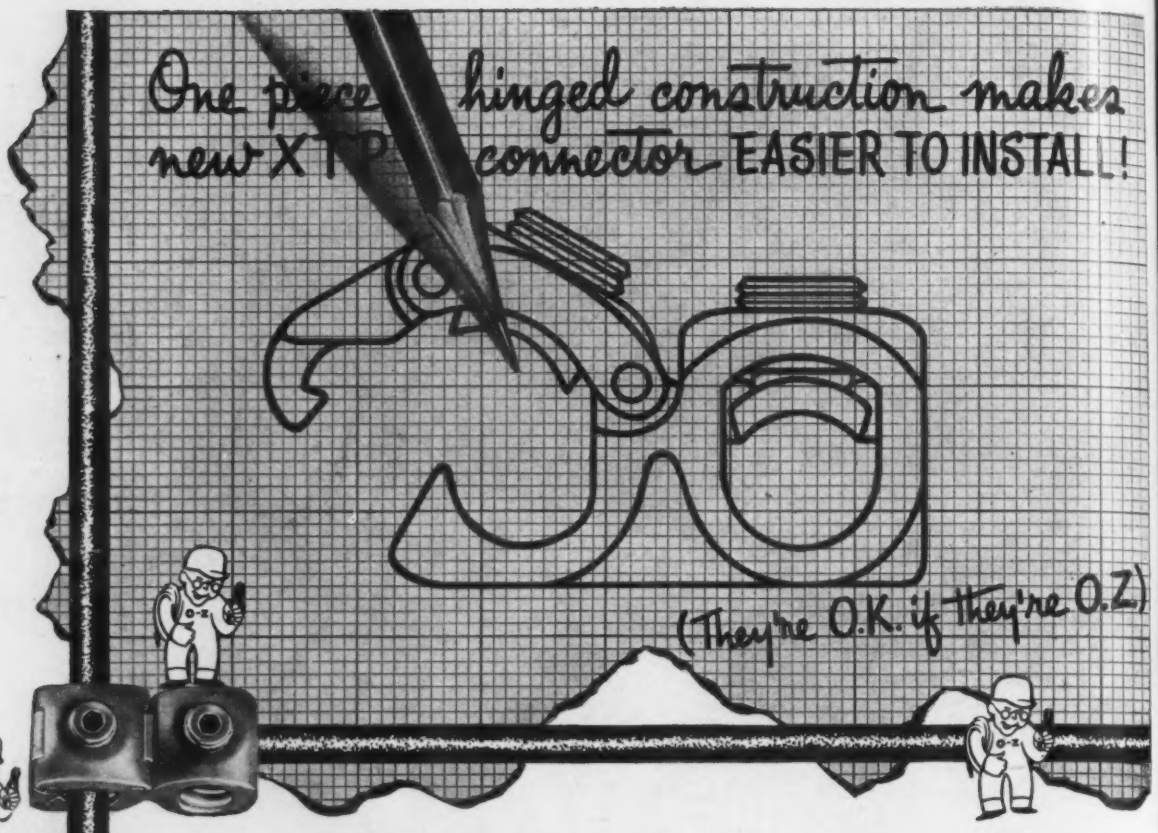
City ..... State .....



FOR TEE OR PARALLEL TAPS YOU'LL PREFER THIS O. Z. FITTING FOR ITS COMPACT SIMPLICITY!

Get strong, positive connections – speedily, simply – with this new one-piece XTP connector. Without loose parts to drop, anyone can install XTPs properly. Merely clamp the hinged jaw over the main and tighten – you've made a permanent connection. Whenever desired, tap can be inserted and tightened in any of three directions without disturbing main.

Other reasons why the XTP is more economical:

- **25 CONNECTOR SIZES** do practically all tap jobs
  Fit over 400 combinations of wire sizes, #8 to 1,000,000 CM
- **SPRING STEEL LOCKWASHERS** (tin plated) maintain pressure
- **PRESSURE PLATES** (non-rotating) serrated for maximum grip
- **HIGH CONDUCTIVITY** copper alloy body
- **EXTRA STRENGTH** copper alloy pressure plates and hinged parts

Used for either tee or parallel taps – one typical XTP replaces 32 different connectors, cuts your inventory to a minimum. Get this time-and-money-saving one-piece hinged connector from your wholesaler. Ask for XTP, made by O.Z.

CONDUIT FITTINGS
CABLE TERMINATORS
CAST IRON BOXES
SOLDERLESS CONNECTORS
GROUNDING DEVICES
POWER CONNECTORS

O.Z. ELECTRICAL MANUFACTURING COMPANY
262 BOND STREET · BROOKLYN 2, N. Y.

3036

IN 1923 THIS SYSTEM Started a Trend!

Today, A-C "Oil-Sealed" Inert-Gas Protection is Specified on Over 5,000,000 kva of Transformer Capacity!

HERE'S A SUCCESS STORY with *hundreds* of happy endings! In 1923 Allis-Chalmers built 18 power transformers, totaling 270,000 kva, for a prominent Eastern Utility. These transformers were equipped with the *first* successful *oil-sealed* inert-gas systems!

For 24 years these original systems have given satisfactory service. Since 1923 *scores* of other Utilities have experienced similar results with Allis-Chalmers *"Oil-Sealed"* inert-gas systems. This has had much to do with the fact that today inert-gas protective systems of one type or another are regarded as *standard construction* throughout the industry!

What's the significance to *you?*

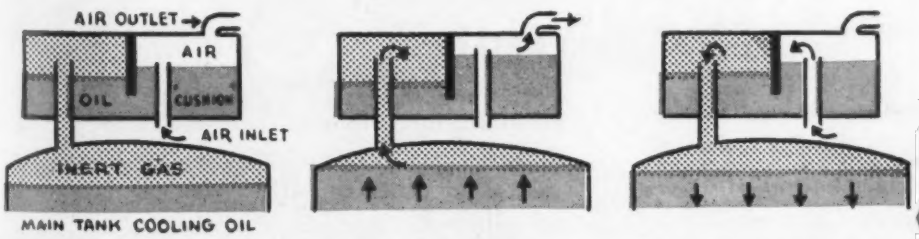
When you specify *any* inert-gas system, you are in step with an established Utility trend. Further, when you specify an *Allis-Chalmers* "Oil-Sealed" system, you are buying the *original* — benefiting from the longest experience. Finally, Allis-Chalmers *"Oil-Sealed"* system gives you these proven advantages:

☛ THE LOWEST-PRESSURE SYSTEM — generally not exceeding 1 lb per sq in. — *less* pressure on gaskets means *lower* gasket maintenance.

☛ SIMPLE DESIGN eliminates sensitive gauges and reduction valves — thus eliminates maintenance of such instruments. Further, periodic replenishment of nitrogen is not needed . . . no bottles to buy.

☛ YOUR CHOICE of location — either top-of-tank or side-mounted. For details, see your nearby "A-C" office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2263



PRINCIPLE — Transformer cooling oil is isolated from the atmosphere by inert gas and oil seal. This prevents sludge formation and fire hazard due to oxygen. By excluding moisture the system maintains high dielectric quality of oil.

AS TRANSFORMER HEATS, the cooling oil expands, displacing inert gas from main tank to auxiliary tank. The transfer of gas to the auxiliary tank is cushioned by the change of oil levels as shown, keeping the main tank pressure low.

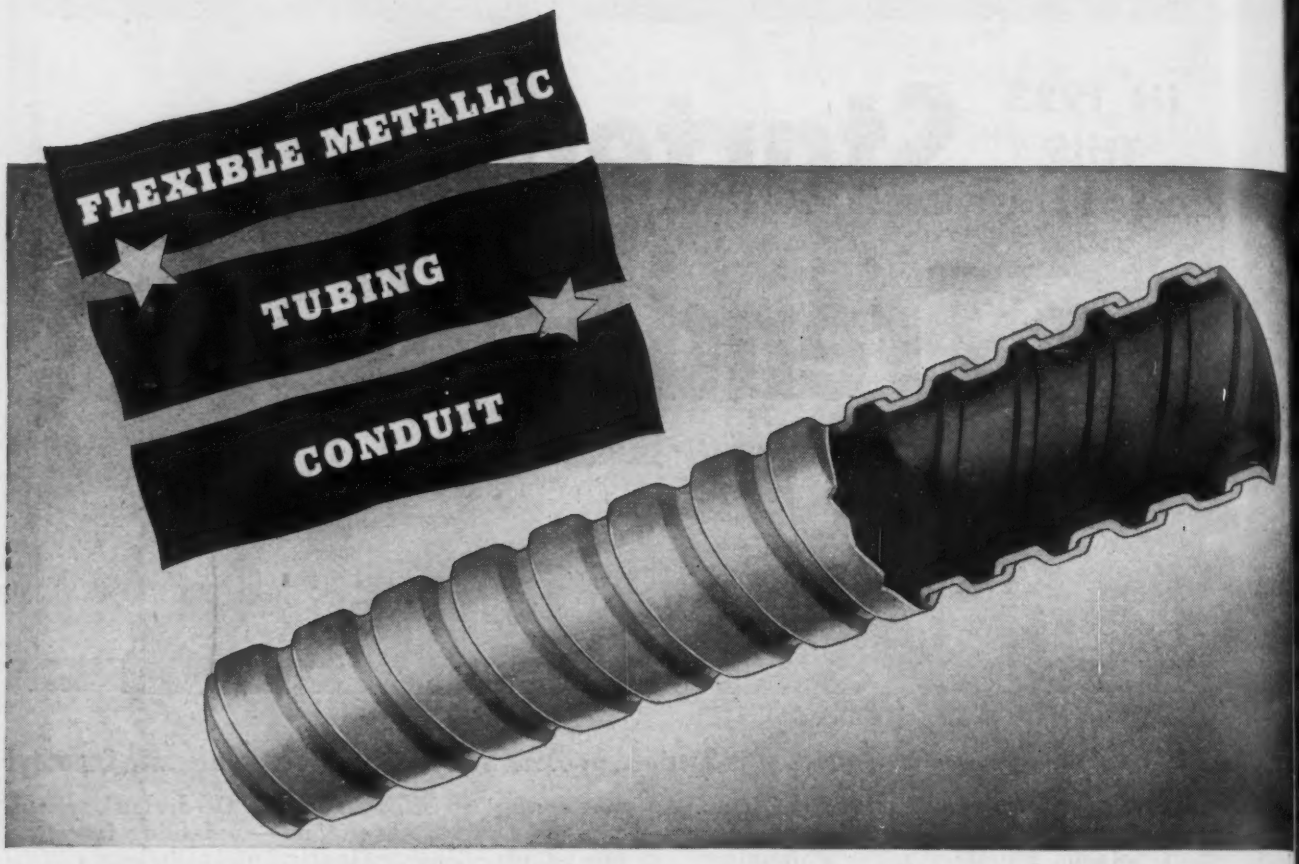
AS TRANSFORMER COOLS, the reverse takes place. In this simple manner inert-gas protection is provided automatically . . . transformer oil adjusts itself to changing temperatures without being exposed to the atmosphere.

HOW THE ALLIS-CHALMERS "OIL-SEALED" INERT-GAS SYSTEM WORKS!

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great



Another WAA Bargain in Electrical Material

■ A huge stock of flexible metallic tubing and conduit will be offered on *competitive sealed bid.*

■ The offering consists of a variety of sizes of flexible brass and aluminum tubing and flexible steel conduit for use wherever protection of cable or wire is essential.

■ Large inventories are held in the following Regional Offices: Cincinnati—Philadelphia—Boston—Detroit—Cleveland—Chicago—Kansas City—New York—St. Louis. Write any of the above offices or visit your Customer Service Center for complete information on this sale. Ask the Regional Offices to place your name on their mailing lists for offerings of this type equipment.

EXPORTERS!

Your business is solicited. Much material which is surplus in the United States is urgently needed or is readily salable in other countries. Watch for other offerings; many of them may be of interest to your clients.

OFFICE OF GENERAL DISPOSAL

WAR ASSETS ADMINISTRATION

GOVERNMENT WAA SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland Denver • Detroit • Grand Prairie, Tex. • Helena • Houston • Jacksonville • Kansas City, Mo. Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha • Philadelphia Portland, Ore. • Richmond • Salt Lake City • St. Louis • San Antonio • San Francisco • Seattle • Spokane • Tulsa

1219

al

Small Cam-Operated
DRUM SWITCHES

SIZE 00 - ¾ hp
SIZE 0 - 2 hp
SIZE 1 - 5 hp

for Multi-Speed Motor Control
Reversing Service
Master or Transfer Switching

An 8-page bulletin is required to describe the great variety of applications and switching combinations of these handy Bulletin 353 cam-operated drum switches. They can be built up to 15 sections, with contacts opening or closing at any point of lever travel. Switching problems can be solved with surprising ease and simplicity. The silver alloy contacts require no cleaning or servicing, because any oxide which may form on the contacts is as good a conductor as the contact metal, itself. There are no sliding contacts . . . the beryllium copper fingers operate with a quick-closing and quick-opening action. Available in three sizes shown above.

Sectional view of Bulletin 353 Drum Switch showing contact sections and central operating shaft with hand lever.

A-B Quality

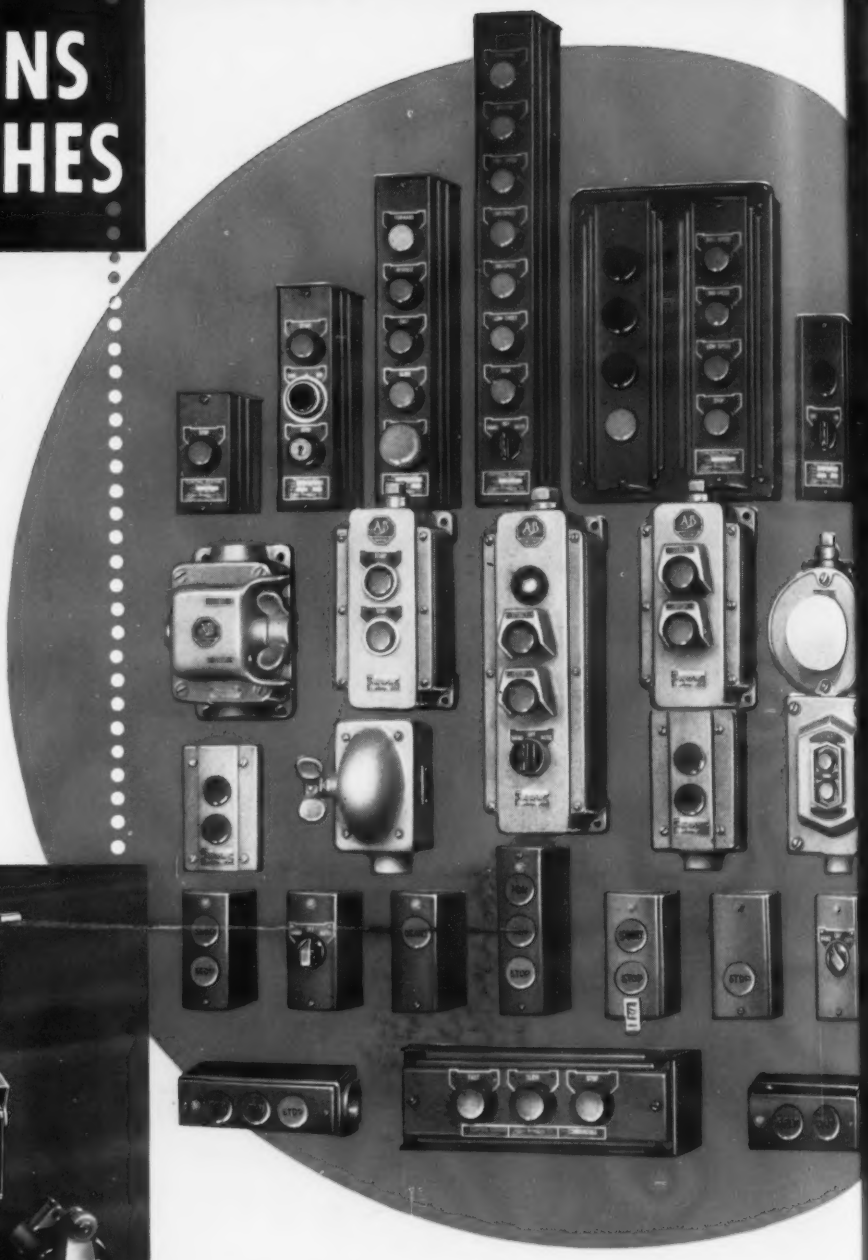
ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

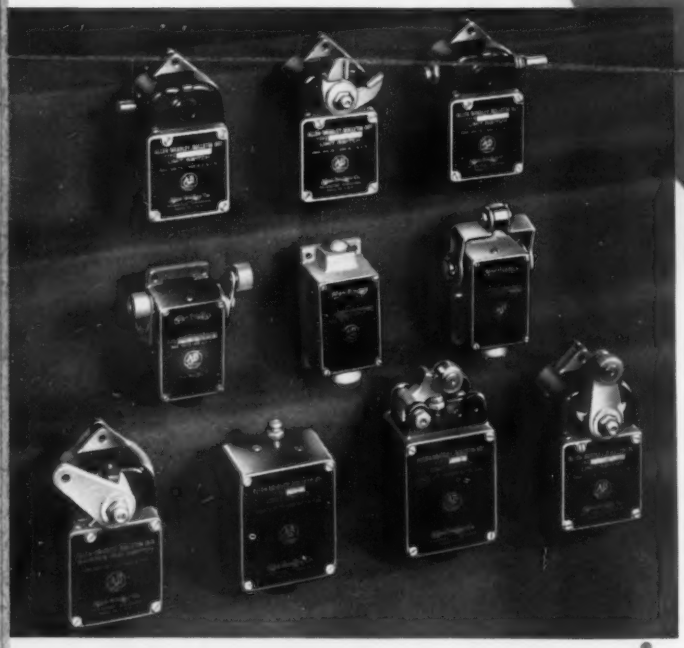
PUSH BUTTONS LIMIT SWITCHES

for

Manual and Automatic Control

If you are designing machines . . . or installing new machines . . . get the most out of them with push buttons or limit switches of the correct type. Added safety can be assured by using extra STOP buttons or perhaps a limit switch. Convenience, speed, and less spoilage are a few other advantages of adequate use of modern pilot control stations.





Limit switches are more than "stop-motion" units . . . they regulate machine speeds during bed travel or automatically put machines through a repeated sequence of operations. Send for Bulletin 801-802 on Allen-Bradley standard, heavy duty, and precision limit switches.

The above illustration shows 25 of the several hundred types of standard push button stations that are listed in Allen-Bradley Bulletin 800. But these few examples will serve to indicate the immense variety of enclosures, button labels, numbers of buttons, and also such auxiliary elements as pilot lights, selector switches, etc., which can be selected from the standard Allen-Bradley line to fit your needs. If you build or use motorized machines, by all means send for Bulletin 800, today.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.

A-B Quality

ALLEN-BRADLEY

QUALITY

MOTOR CONTROL

lred typ
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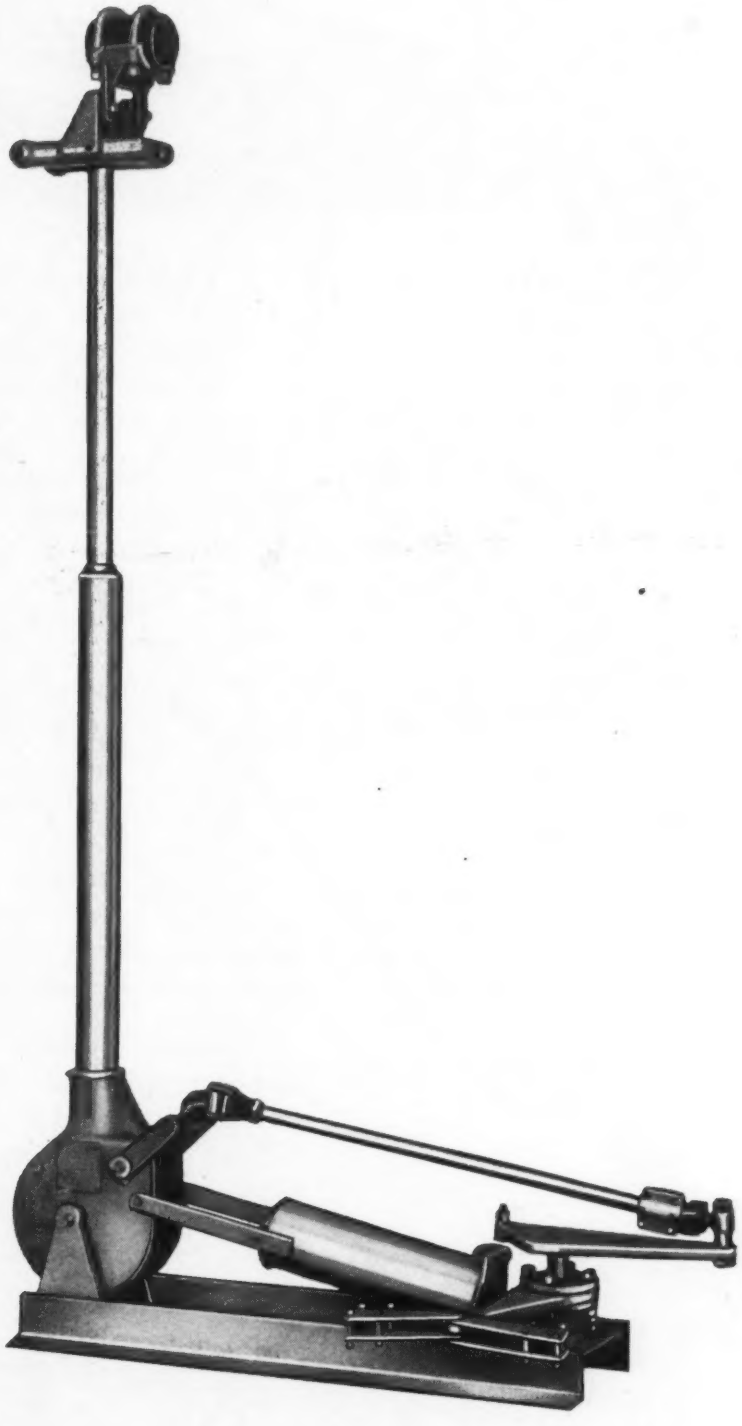
Cole Electric Co.

8439 Steller Drive Culver City, Calif.

AShley 4-3243



OUTDOOR BUS GROUNDING SWITCH

230,000 Volts, 1200 Ampere. Type O
Three pole single throw.
Remote Manual, group operated
(1 pole shown)

Kearney TRIP-O-LINK Protection

Stops TRANSFORMER BURNING

WHEN properly fused for overload protection Kearney Trip-O-Link Fuse Cutouts eliminate the costly nuisance of burning up transformers.

The Trip-O-Link, an original Kearney design, is so unique, so simple, so positive, that it cannot fail to operate. The combination fuse link and cartridge is kept under constant coil spring tension. When a fault occurs this tension separates the link quickly and positively—leaving a wide air gap that prevents current leakage between the contacts. The separating action breaks sleet and ice, provides dependable operation in any weather.

You can't afford to be without the low-cost protection of Trip-O-Link fuse cutouts. For about $7.00 you can protect a transformer costing nearly $200.00—for years to come.

For Best Fusing Coordination Use
TRIP-O-LINK FUSE LINKS
Available in two characteristics—fast or slow, in 1 to 100 ampere sizes and voltage ratings 2.3 to 69 KV.

93

For Better Results

Specify Kearney Products

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PRODUCT NEWS

Electronic Analyzer (700)

A new compact electronic analyzer for voltage, current and resistance measurements covering frequency ranges of practically all present electronic applications has been announced by Weston Electrical Instrument Corp. Known as Model 769, this instrument embodies in one unit a stable high-frequency vacuum tube volt meter for frequencies up to 300 megacycles, an electronic volt ohmmeter and a complete 10,000-ohm-per-volt d-c and 1,000 ohm-per-volt a-c multimeter. Use of a new type, unity gain d-c amplifier, incorporating both regeneration and degeneration, is said to give remarkable stability of the electronic circuits in the vacuum tube volt meter and the electronic volt ohmmeter. Model 769 is completely line isolated and line insulated to reduce external radio frequency influence. Limed-finish solid oak case measures 10x13x 6⅛ in.

Ohmmeter (701)

A pocket-sized ohmmeter for spot checking radio and electronic circuit components, relays, generators, starters, electric clocks, etc. has been developed by Sylvania. It is enclosed in a tubular plastic case ⅞ in. in diameter and 5¾ in. over-all. The prod tip base and top cap, of green molded bakelite, are mounted in a transparent cellulose acetate tube housing the meter. Direct readings between 0 and 10,000 ohms are given on a 1.5-milliampere full-scale sensitivity Weston meter in series with a 1,000-ohm molded carbon resistor and a standard penlight dry cell. Test electrodes include a stainless steel prod built into the meter case and one secured to the tip of a 17-in. test cord.

D-C Timing Motor (702)

A. W. Haydon Co. is producing a d-c timing motor, with speed range from 2 r.p.h. to 1,800 r.p.m. It is totally enclosed in welded housing; has lifetime sealed-in lubrication; weighs 6 oz. Dimensions are 2½x2⅛x11/16 in. Current consumption is said to be under 100 milliamperes. Brushes have an approximate life expectancy of 5,000 hr. Motor can be operated from a small amplifier tube or flashlight battery for remote electronic control.

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BETTER LIGHT

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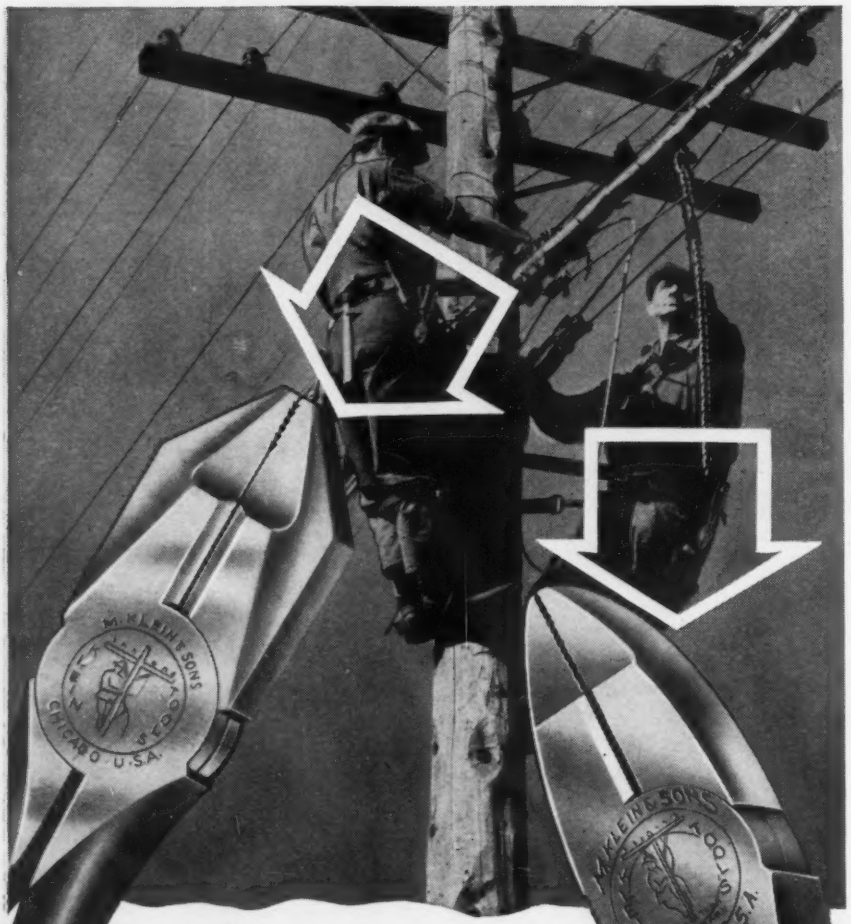
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.

OFFICES IN PRINCIPAL WESTERN CITIES • BRANCH AND WAREHOUSE IN SAN FRANCISCO



Linemen are Kleinmen

• Over the years the men who string and maintain the nation's power and communication lines have come to know and rely on Klein Pliers. That's why you will find Klein Pliers in the hands of the man on the pole—why linemen are Kleinmen.

And there's good reason back of this preference for these quality tools. Drop forged from fine alloy steel, each pair individually tempered and tested, Kleins have just the proper balance . . . just the right spring to the handles to minimize hand fatigue. A fitted hinge keeps jaws perfectly aligned . . . carefully matched knives stay keen.

Keep Klein Pliers on order—your supplier will meet your requirements as soon as possible.

Ask Your Supplier

***Foreign Distributor:* International Standard Electric Corp., New York**

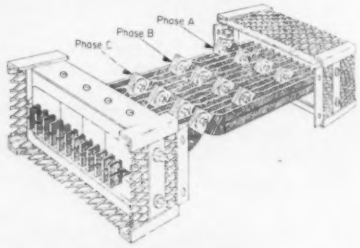
A copy of the Klein Pocket Tool Guide, showing the Klein line and containing valuable tool information, will be sent on request.

Since 1857

Mathias KLEIN & Sons
Established 1857 **Chicago, Ill., U.S.A.**
3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

Feeder Bus (703

Designed for long runs of large alternating currents, the new Universal feeder bus announced by National Electric Product Corp. is available in 800-, 1,000-, 1,350-, 1,600- and 2,000-amp. capacities; in 2-pole single phase; 3-pole, 3 phase; and 3 phase 4-wire. Protected by an expanded steel mesh on all sides, the bus bars are interlaced, wrapped and insulated to insure least possible temperature rise. To join the 10-ft sections, the silver-plated ends of the individual bus bars are bent outward and edgewise at a 45° angle. A steel bolt, fitted with large flat and lock washers, is inserted to draw the bus bar ends together in a firm and positive joint. Cable lugs or other bus bars may be bolted at these joints for desired take-offs. This bus can be mounted or suspended in the conventional way or by means of connecting to insulator frame support bolts which are spaced every 20 in.



Identification Yarns (704

According to Owens-Corning Fiberglas Corp., dyed Fiberglas yarns, for identification of electric wires and cables, are being produced in the following colors: blue, orange, green, yellow, black, brown, slate, red and purple. Production of dyed Fiberglas identification yarns in colors has been made possible by development of a new process of film coating whereby the yarns can be dyed with ordinary dyes and by commonly used methods. The protein film, applied to the yarns as they are formed, represents only one to two per cent, by weight of the finished yarns, but improved depth of color has been secured, the company states. The yarns are resistant to heat, moisture and fungi.

Multipliers (705

Three new clip-on type multipliers have been announced by G-E as an exposure meter accessory. These multipliers will extend the range of all DW-48 and DW-58 exposure meters up to 7,000 ft.-candles. They came in three ratios which will measure light up to 700, 1,400, 7,000 ft.-candles respectively; are listed to retail for 70c each.

Control Unit Panel (706

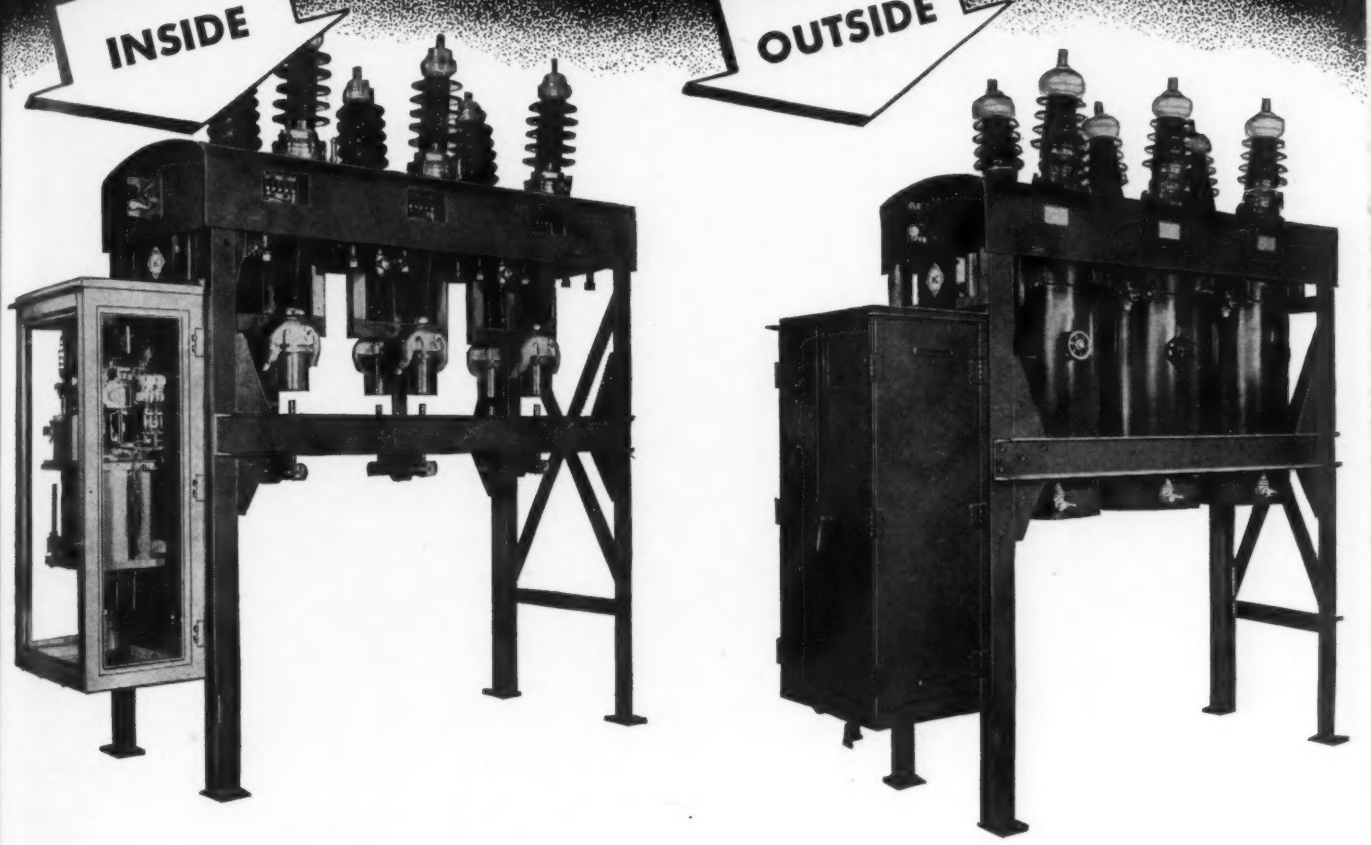
Cutler-Hammer is making an electronic control unit panel with a captive wing nut mounting and multiple contact plug arrangement said to permit instant substitution of a spare panel. In addition to the quick-change feature, simplicity of design and better spacing of components are claimed to cut maintenance costs.

Panel Meters (707

Simpson Electric Co. is making panel meters with illuminated dials in 2- and 3 in. sizes, rectangular and round cases. A Lucite cone carries the light from a recessed bulb in the back of the instrument through the front edge of the cone, which entirely surrounds the dial face.

HERE'S WHAT WE MEAN BY

Full Weather Protection!



"UNITOP" Oil Circuit Breaker Has *One-Piece* Top Frame —*Sealed* Mechanisms—*Internal* Wiring—*Heavy* Steel Frame—For *Longer* Life, *Lower* Maintenance!

OUTSIDE—The smooth exterior of the Allis-Chalmers "Unitop" oil circuit breaker seals out snow, sleet, and rain. A one-piece, continuous heavy steel top frame covers all three poles. All wiring is carried in sealed ducts within the top frame eliminating crevices that collect dirt and water and invite corrosion. Heavy-gauge steel tanks are gasket-sealed to top frame and designed with wide bases for protection against spilling accidents when tanks are lowered to the ground for maintenance checks.

INSIDE—Entirely enclosed mechanisms are built for long, trouble-free service. The Allis-Chalmers high-speed "Ruptor" interrupting device—two per pole—increases life of contacts and oil, and reduces tank pressures by high speed interruption of arc in its oil-filled pressure chamber.

Allis-Chalmers "Unitop" type FZO-150 frame mounted outdoor oil circuit breakers are supplied in ratings from 15 to 46 KV, standard sizes up to 2000 amperes, and with interrupting capacities from 500,000 to 1,500,000 Kva. They can be equipped with either a pneumatic or solenoid operator. Contact your nearby Allis-Chalmers office or write for bulletin 71B6421. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2275

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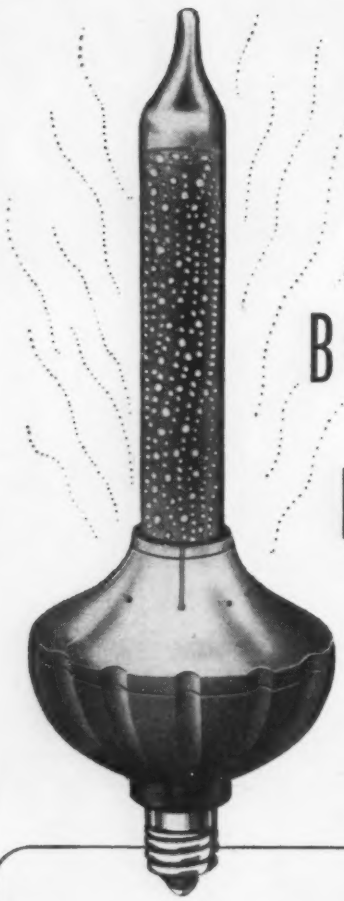
ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment
Biggest of All in Range of Industrial Products

COMPLETE BREAKER LINE—Power—2500 to 230,000 volts; Oil — from small indoor switchboard to large indoor and outdoor types; Indoor—2500 to 34,500 volts, 15,000 to 1,500,000 kva; Outdoor — 7.5 kv up, 50,000 to 3,500,000 kva.



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by ROYAL

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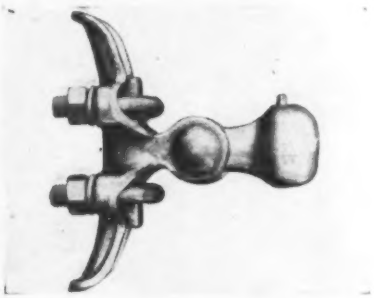
PAWTUCKET • RHODE ISLAND

REPRESENTED BY: NORTHWESTERN AGENCIES, INC., SEATTLE, WASHINGTON
ECKERT-LLOYD CORP., SAN FRANCISCO & LOS ANGELES

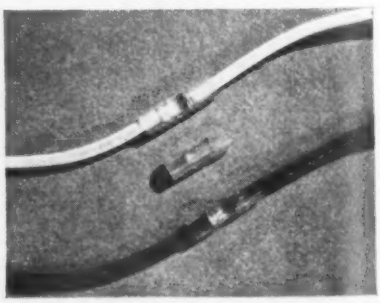
Clamps (708)

Brewer-Titchener Corp. is redesigning the smaller bore sizes of its Series 6200 clamps. The new Series 6200A forged steel suspension clamps feature lighter weight, shorter clamp body, improved clamp-body-seat and keeper contour with maximum clamping pressure at keeper center, factors in preventing possible cable-vibration damage. The new design is said to permit greater vertical-line-angle accommodation with socket and new clevis connectors of forged steel. Absence of corona inducing sharp edges is standard, according to the announcement. There are seven size groupings with cable sizes ranging from 0.125 to 1.15 in. Copper or aluminum liners and either "J" or "U" bolts may be specified. The new clamps are for use on all conductors and ground wires except the hollow copper type.



Pressure Connectors (709)

Thomas & Betts has announced an addition to its line of Sta-Kon pressure connectors, the No. 25 insulated splice. It is a seamless bronze connector protected with a translucent high-dielectric plastic insulator which is impervious to oil, grease, water, chemicals and acids. The insulator is bonded to the connector and cannot slip or become accidentally detached, according to the announcement. Connection is obtained with Sta-Kon hand or power-operated tools. A single squeeze of the installing tool permanently connects both wires and insulates the connection.



Air Conditioners (710)

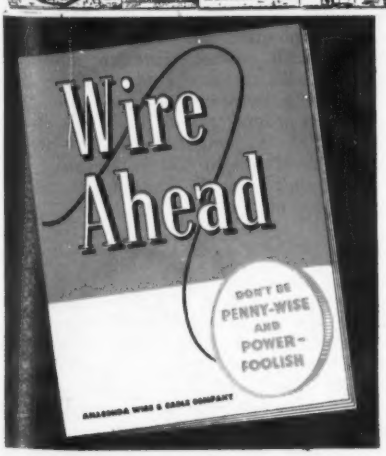
Westinghouse has started manufacture of newly designed air conditioning units for retail stores, candy shops, restaurants, etc. They are being made in 2-, 3- and 5-hp. units; have been reduced in size as much as 15%, in weight as much as 20%. Each cabinet-enclosed unit includes compressor, condenser and evaporator for cooling and dehumidifying, glass wool filters for cleaning and a fan for circulation. A heating coil and humidifiers may be added for year-round air conditioning. The 2-hp. model conditions up to 800 cu. ft. of air a minute; the 3-hp. up to 1,200 cu. ft.; the 5-hp. up to 2,000 cu. ft. The 5-hp. model furnishes the same cooling effect as would the melting of 5 tons of ice every 24 hours.

Arrest this Thief!

INADEQUATE WIRING, the industrial jinx, can rob any plant large or small . . . of as much as 25 to 50 percent of rated efficiency. And what's most discouraging, the greater the production load, the deeper he digs into your resources.

Obsolete, overextended, overtaxed wiring may be difficult to detect, but it's too expensive to ignore. You may not be able to see this demon, but your plant power engineer, your consulting engineer, electrical contractor, or utility power salesman *can*. A little policing now may save expensive alterations later.*

47449



*WIRE AHEAD, a new booklet discussing preventive maintenance . . . the symptoms of inadequate wiring . . . and presenting plans for anticipating electrical demand, is now in preparation. We shall be glad to send it on request as soon as it is available. Address Advertising Department, 25 Broadway, New York 4, N. Y.

ANACONDA
from mine to consumer

ANACONDA WIRE AND CABLE COMPANY

Handy . . . Easy to Carry . . . Serviceable

BUCKINGHAM Bags and Pouches

of Binghamton

No. 305
BUCKINGHAM'S CANVAS DUCK BAG

A zipper-closing, heavy-duty, drab canvas-duck bag, reinforced at the bottom and sides. All seams strongly stitched throughout. Plenty of room for tools plus extras such as work clothes. In three sizes — 20", 22", 24" long, x 10½" wide x 12" high.

Carry your tools with you wherever you go . . . always know where they are . . . with Buckingham bags and pouches. The Buckingham quality line of electricians', linemen's and mechanics' equipment is your best insurance against misplacing and losing valuable tools. Write today for new illustrated folder showing many new items in the famous Buckingham line!

No. 303
LEATHER TOOL BAG

Made of heavy, durable leather. Stoutly stitched and riveted for years of service. Convenient to carry tools, emergency kit, etc. 15" long x 6½" wide x 7" deep.

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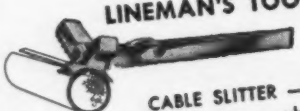
RUBBER GLOVE BAG

Keeps your gloves dry and clean, and you won't lose them off your belt! Compact, heavily stitched. 8/0 vat-dyed olive drab duck. 16" x 8" x 4".

No. 650
TOOL HOLSTER

One large, two small and two deep wing pockets for various tools. Knife snap optional. Of finest leather, heavily stitched and riveted.

A NEW--HANDY LINEMAN'S TOOL



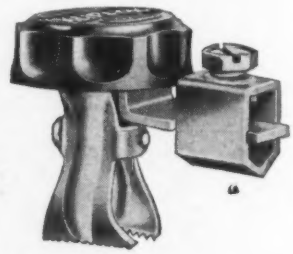
CABLE SLITTER — will slit the lead sheath of any cable in general use. Adjustable blade, dog for spreading; adaptable to right and left hand use. Safe, simple, easy to use.

Write today for new illustrated folder on Mechanics Pouches! Buy from your own equipment dealer. *Prompt Delivery.*

BUCKINGHAM MANUFACTURING CO., INC.
Walter E. Craw, Pres. 5-7 Travis St., Binghamton, N.Y.

Test Clamp (711)

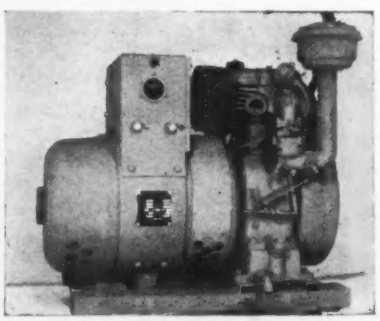
The new Trico U-66 all-purpose Kliplok test clamp takes round or flat objects up to 1 in. in diameter or width; such as fuse clips, meter or motor terminals, cables, bus bars, lugs, screws, etc. It will carry up to 150 amp. continuously and 200 amp. intermittently. Solderless lug accommodates No. 2 wire minimum; No. 0 wire maximum and swivels around the clamp, permitting wire or cable to hang in a natural position.



A-C Plant (712)

Kato Engineering Co. has announced a new 2,500-watt a-c Katolight plant model which is self-excited, cranks from 24 volts of battery. The d-c winding has sufficient capacity to charge a standard 32-volt glass jar type battery. This plant is complete with battery charging relays and the charging rate automatically adjusts itself. When the plant is carrying a full a-c load, there is little, if any d-c battery charging, according to the company, when only a partial a-c load is carried, the battery is charged at a proportionally greater rate.

It may be furnished with full automatic control or remote control. A voltage regulator holds a-c voltage within 5 volts change between no load and full load.



The generator is mounted directly on side of engine which is a Briggs & Stratton ZZP, 1 cylinder, 3-in. bore, 3¼-in. stroke, 1,800 r.p.m., oil bath air cleaner, ignition filtered and shielded, sensitive governor, engine generator mounted on welded steel base equipped with rubber vibration absorbers. Available with gravity feed gasoline tank or fuel pump to permit drawing fuel from large under-ground supply tank. Length 28 in., width 20 in., height 26 in. Net weight 380 lb., crated weight 450 lb. Gasoline consumption—full load 2¼ hr. per gal., partial load 3¼ hr. per gal. (approx.).

F Fixture (713)

Fluorescent Fixtures of California has announced the All-Brite Hinge-Master, a fixture with a hinged glass bottom which will drop to either side, and a hinged fixture body for access to ballast and sockets. Available in either four 20-watt or four 40-watt tubes and made either with a louvered or plain glass bottom.

GREGORY TRANSFORMERS

. . . AUGUST DELIVERY!

850 —15 K.V.A. Gregory, Type HE, continuous duty 55 Deg C rise, 2400 volts primary, 120/240 volt secondary, single phase, 60 cycle, oil immersed self-cooled distribution outdoor transformers, complete with new transformer oil, and standard NEMA accessories.

These are new transformers manufactured by Gregory to strict specifications in accordance with NEMA and AIEE requirements.

PERCENT EFFICIENCIES OF TRANSFORMERS

¼ Load	½ Load	¾ Load	Full Load
97.5	97.9	97.7	97.5

These transformers are furnished in round heavy gauge steel tanks suitable for pole or platform mounting with wet process porcelain solderless stud type primary and secondary bushings.

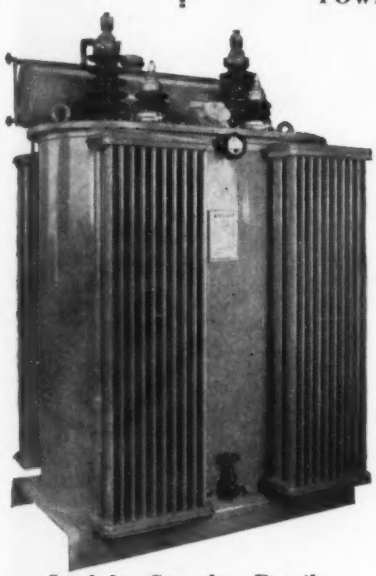
150 15 K.V.A. Gregory, Type HET, continuous duty 55 Deg C rise, 2400 volt primary, 230 volt secondary, 3 phase, 60 cycle, oil immersed self-cooled distribution outdoor transformers, complete with new transformer oil and standard NEMA accessories.

100 15 K.V.A. Gregory, Type HET, continuous duty 55 Deg C rise, 4800 volt primary, 460 volt secondary, 3 phase, 60 cycle, oil immersed self-cooled distribution outdoor transformers, complete with new transformer oil and standard NEMA accessories.

These transformers have an approximate 10% full capacity secondary tap to compensate a possible voltage drop. They are suitable for pole or platform mounting and are equipped with wet process porcelain stud type primary and secondary bushings.

NEW GREGORY TRANSFORMERS

POWER DISTRIBUTION AND SPECIAL TYPES



Send for Complete Details Order NOW!

- UNIQUE DESIGN—afford low copper and core losses—extra factor of safety protects against temporary overloads or power surges.
- CONSTRUCTION — tanks constructed of heavy gauge copper bearing steel welded throughout.
- OIL—Hi-Grade insulating oil used exclusively.
- BUSHINGS—Highest grade of wet process porcelain.
- ACCESSORIES—Highest Quality obtainable meeting our exacting requirements.
- INSULATION—Coordinated with bushings to protect against surges.

SPECIAL NOTICE

We are now accepting orders on New Gregory Transformers for delivery in the fourth quarter of 1947.

Orders will be filled in priority of date received.

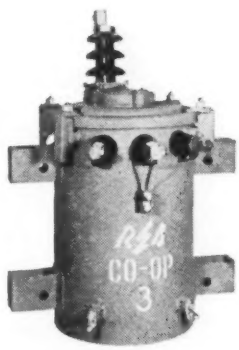
September deliveries on the following:

2400 Volts Primary, 120/240 Volts Sec.
25, 37½, 50, 75 & 100 KVA

2400 V. Primary, 240x480 V. Secondary.
25, 27½, 50, 75 & 100 KVA

2400 V. Pri., 120/240 or 240x480 V. Sec.
333 KVA 500 KVA 1000 KVA

22000 V. Primary, 2400 or 240/480 V. Sec.
833 KVA 1000 KVA



3 K.V.A. Gregory Rural Conventional Distribution Transformer 7200/12,470 Y Volt Primary, With Standard Taps, 120/240 Volt Secondary, Single Phase, 60 Cycle.

Gregory Rural Distribution Transformers are approved by the Rural Electrification Administration, Washington, D. C.

All transformers manufactured by Gregory Electric Company are thoroughly tested in conformance with A.I.E.E. and covered by an iron clad liberal standard one year guarantee.

GREGORY ESTABLISHED 1893 Hi-Grade

GREGORY ELECTRIC CO.

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CHICAGO 14, ILLINOIS

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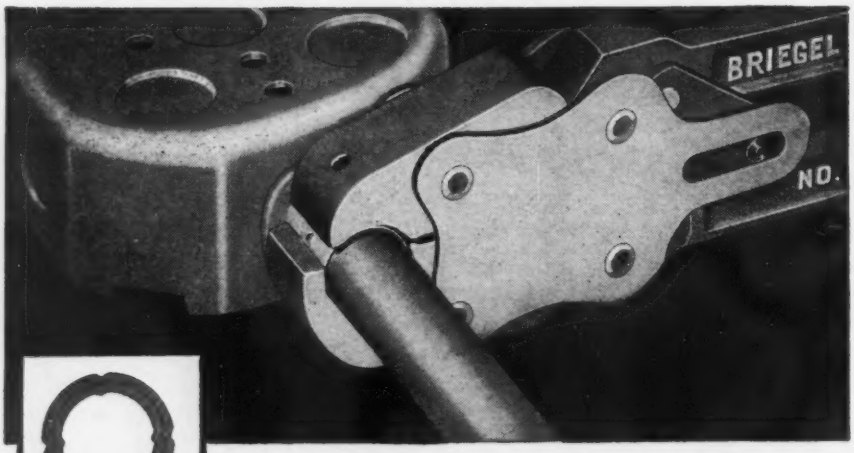
606 SOUTH HILL STREET
PHONE: MUTUAL 4169



Cross section Showing Indentations.

E·M·T· UP THE QUICK WAY
Two Squeezes and it's Set

TWO QUICK SQUEEZES give you Finer, Faster Conduit Connections. B-M Fittings do away with the twisting, turning and tightening of nuts and save you valuable time and materials. Then too, they are stronger, neater and much easier to work with in tight places. Start using B-M Fittings today. Have more satisfied customers—more profits from each job!

(All B-M Fittings carry the Underwriters Seal of Approval)

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BRIEGEL METHOD TOOL CO. • Galva, Ill.

RELIANCE AUTOMATIC TIME SWITCHES

Model "W"

Completely automatic . . . extremely simple, compact, economical . . . three types cover practically every requirement . . .

Astronomic Time Switch

• The Model "W" Astronomic types are particularly popular for advertising illumination. The "on" operation changes daily to correspond with local sunset time, eliminating the necessity of re-setting the dial as the days become longer or shorter.

AMERICA'S RELIABLE
24 hour-a-day GUARDIANS

RELIANCE Time Switches have proved their dependability. They give complete and reliable service under many varied conditions — a factor of paramount importance when constant good service is essential. Send for catalog and price sheets for complete details.

RELIANCE AUTOMATIC LIGHTING CO.
1907 MEAD STREET RACINE, WISCONSIN

Lamp Lighter (714)

Matthews Lamplighter 1500 is thermally operated and is said to give positive on and off operation of multiple street lights on single- or three-phase circuits at any setting of time switch or photoelectric controls.

These lamplighters will operate any number of lamps up to their current ratings and will operate on a-c or d-c within their rating of 120 to 90 volts. Lamps also may be connected to existing secondary circuits and, with a lamplighter at each lamp location, can be operated automatically at full voltage by a single control wire from the time switch or photoelectric control.

Furnished with switch contacts either normally closed or normally open, the lamplighters may be used in the same circuit with relays already installed by selecting the proper contact specifications.

Switching mechanism is protected by a sealed, watertight frosted glass housing.

Variations in ambient temperatures will not affect operation time as design automatically compensates for extremely high or low temperatures, within a range of plus 130°F to minus 60°F.

Hanger design permits mounting on pole or crossarm by means of lag screw or through bolt. Maximum width of 2⅞ in. permits entrance to bases of most metal or concrete street light standards. Fourteen-inch insulated lead wires are identified by color for connection as shown in circuit diagram on name plate. The manufacturer states that this device was subjected to an acceleration life test corresponding to 16 years of operation.

Capacitors (715)

A new series of Superex-treated paper capacitors for fluorescent lamp ballasts has been announced by Solar Mfg. Corp. A complete range of capacitance values is available in round, flat oval, deep oval and brick-shaped, lead-coated steel cases. Solar's new synthetic Superex impregnant is said to give long life and stable electrical characteristics at high operating temperatures.

NOW... ALCOA ALUMINUM FOR BUILDING WIRE!

Here's good news for architects, builders, and electrical contractors!

Aluminum Building Wire in sizes No. 12 A.W.G. to 1,000,000 C.M. and larger are now in production. They have the approval of Underwriters' Laboratories, Inc., and meet the requirements of the 1947 National Electrical Code.

Since 1898, Alcoa Aluminum has been in service in high-voltage conductors on this nation's transmission systems. More than 1½ million miles of aluminum electrical cable are in use today in all parts of the country.

On the job, aluminum conductors have proved themselves efficient and dependable for use wherever electricity is conducted.

Aluminum Building Wire, made from Alcoa Aluminum, is now available from manufacturers of insulated wire for use in homes, factories, stores, etc.

See your manufacturer, distributor, or jobber for further information on Aluminum Building Wire. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Bldg., Pittsburgh 19, Pa. Sales offices in leading cities.

MORE people want MORE aluminum for MORE uses than ever

ALCOA FIRST IN ALUMINUM

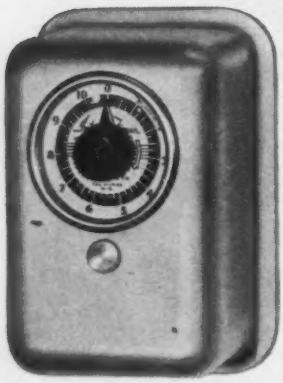
IN EVERY COMMERCIAL FORM

EXTRA PROFITS

with attic and window

fan controls

by **Paragon**



- **Two time ranges . . . 0 to 10 hrs.; 0 to 20 hrs.**
- **Telechron motored . . . quiet; no ticking, self-starting, synchronous.**
- **Underwriter's approved for 115 V. A.C., ¾ H.P. loads . . . accurate and dependable.**
- **Easy to install, direct to handy box or surface mount with conduit connection through bottom of timer.**

For extra profits this spring and summer, get set to install these new timers, now. They work with any A.C. fan, and the setting may be changed at will without harming the instrument. Timer motor runs only when timer is in operation.

List price only $9.75 F.O.B. Two Rivers . . . an outstanding value.

Order from your jobber now . . . and ask for Sales Aids.

PARAGON ELECTRIC COMPANY
1616 TWELFTH STREET
TWO RIVERS . WISCONSIN

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Paragon Two Rivers WISCONSIN
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1903

BULLETINS ETC.

Varnish Data (716)

Irvington Varnish & Insulator Co. has prepared a wall chart presentation of essential physical, chemical and electrical data on its Harvel and Irvington insulating varnishes. Suitable for either office file or shop wall reference, the chart lists suggested uses for the varnishes described; comparative baking and drying times, dielectric strengths and resistance to oil, moisture and chemicals; recommended solvents and methods of application.

All types of paint and varnish manufactured by the Irvington company are included—Harvel and Irvington baking and air drying insulating varnishes; finishing and sticking varnishes; oil-proof and machinery enamels, and insulating paint.

Supervisory Equipment (717)

Automatic supervisory equipment for the remote control power apparatus is described in GEA-1448B, a 7-page General Electric bulletin. Information on application, operation, and the use of accessory equipment is illustrated by interior and exterior photographs of the units.

The supervisory equipment can operate over a single frequency carrier channel or a wire metallic circuit, any number of apparatus units in one or more outlying stations and have continuous indication in the position of any number of apparatus units in such outlying stations.

Resistors (718)

A new 16-page catalog describes, in pictures, charts and text, the I-T-E line of standard fixed and adjustable power wire wound resistors. This catalog contents include charts for resistor selection, resistor formulas, resistor uses and applications, derating data, and construction and ordering information. Each resistor type is pictured wtih a listing giving size and rating. Ratings range from 2 to 215 watts in fixed and adjustable types and from 30 to 75 watts in oval types. Complete technical data on connections, mounting, etc., is also included.

Trolley Coaches (719)

A G-E bulletin on trolley coaches tells development; advantages of operation; where they may be used economically; operations, specifications.

Instruments (720)

Many d-c selsyn remote-indicating instruments initially designed for aircraft use may be applied equally well to industrial applications. Information on the selection and application of d-c selsyn three-wire system indicators and transmitters is contained in a new bulletin GET-1304, now available from the General Electric Co.

Electrical Diagrams (721)

Purpose and use of electrical diagrams supplied with G-E switchgear equipments is explained in a new bulletin, GET-1293. The 23-page publication offers practical guidance on the use and functions of four types of electrical diagrams: one-line, elementary, connection, and interconnection. Sample illustrations of each type of diagram are used. A glossary of device elements is provided to supplement the description of the objects achieved by each of the four diagrams.

Carbon Brushes (722)

A new bulletin, MT, for motor repair shops and industrial plants, has been issued by Helwig Co., manufacturers of carbon brushes. Featured are Transert brushes, which are designed specifically for use under bad atmospheric conditions.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

700	701	702	703	704	705	706	707	708
709	710	711	712	713	714	715	716	717
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Name . . . . . Company* . . . . . Title* . . . .

Address . . . . . .

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

Electricians

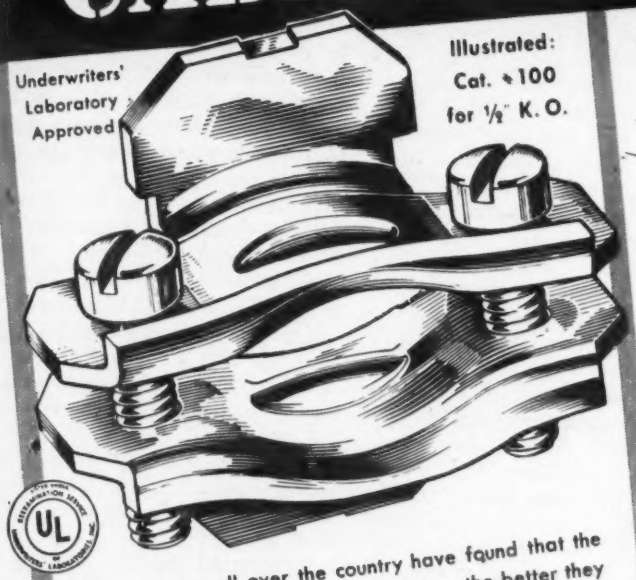
KISS THOSE

troublesome cumbersome

LOCKNUTS GOOD-BYE

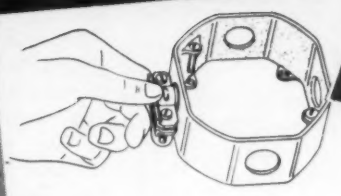
When they turn to

TOMIC *Non-Metallic* CABLE CONNECTORS

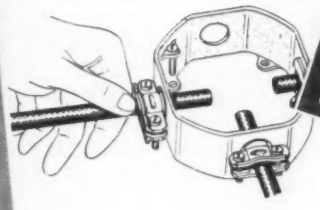


Underwriters' Laboratory Approved

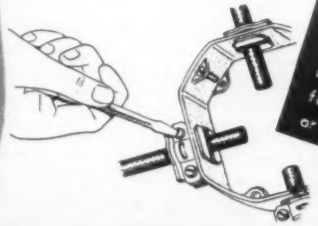
Illustrated: Cat. #100 for ½" K. O.



TIP a Tomic cable connector into the hole from outside. Fits in quick and easy!



SLIP the cable through! Will handle both new and old type non-metallic sheathed cable!



FLIP the screws on tight —and the job is done right! Exclusive locking feature holds connector securely!

Electricians all over the country have found that the more they use Tomic cable connectors, the better they like them! Because Tomic connectors are installed from the outside of the box, with no locknuts to lose or fumble with, they help do the job easier, quicker, better—and at a saving right from the start! The sooner you order them, the sooner you'll be re-ordering them because they'll move fast. We're now making millions per month —write today for any quantity.

Cat. No. 100—½" K. O.
Cat. No. 200—¾" K. O.

Patent Nos. 2097695 2419426

Tomic Sales & Engineering Co.

4864 Woodward Ave. • Detroit 1, Michigan

ELECTRA'S HUSBAND

IT'LL BE A LONG LONG TIME

"IF YOU want to know why we are not going to build a little place in the country, take a look at this," I said to Electra one evening recently after glancing at a story in that week's issue of *LIFE*. "It will tell you why a $25,000 home will cost $50,000 or a $5,000 home $11,000 if you built it today."

"You didn't tell me we were not going to build the country place," Electra said with a trace of disappointment. "I thought you were talking to some contractors about it."

"I didn't tell you because I knew you would feel bad. And I did talk to some contractors. That's why we are not building. The minimum cost of a five-room place we have been thinking about would be $8,500 and that doesn't include the outdoor living room that you wanted. And it doesn't include any of the equipment like a freezer or a range or water heater. Nope, we can forget that luxury for awhile. Costs will have to come down."

"It says here that the building boom has collapsed," Electra said pointing to a page in the magazine. "It blames material shortages, high prices and the unions. Is that right?"

"Partly," I answered. "Government regulations have had something to do with it. But most of it stems from labor—slowdowns and lack of enough skilled workers because of abuses of the apprentice system. When you stop to think that some nineteen different crafts are required to build a house, that their rules won't let a plumber do any sheet metal work on a heating system or a plasterer put up lathes and that overtime rates have to be paid for much of the work, you can see why we and millions like us won't build."

"This story says that bricklayers only lay half as many bricks and carpenters only set six doors where they used to set ten," Electra commented. "It is like that with all workers?"

"With many of them, yes," I answered. "But the whole thing is a lot deeper than that. Take electrical workers, for instance, because I happen to know something about them. The average age, because of failure to bring in apprentices, is up in the fifties. That means they can't turn out the work that they did previously. On top of that the contractor who employs them has to pay higher overhead, in one instance to insure that they receive a pension from union funds. Sum and substance of the whole thing is that construction of all kinds is being priced right out of the market."

"Mrs. Miller had an experience which proved that," Electra said. "You remember you always said that they had the slickest and most complete and convenient small house you ever saw—two bedrooms, a den, a nice patio as well as a big living room and dining room. She said the house cost them about $6,000 when they built it in 1933. Of course that was at the bottom of the depression so things were cheaper. But she just had another bedroom and bath added onto one wing. Can you guess what it cost?"

"Oh, a couple of thousand bucks."

"Guess again," Electra said. "The bill came to $3,200 for just one more room. And she said the contractor was a friend of Mr. Miller's."

"Wow! What a friend!" I said. "But then it just proves what I said. People won't pay those prices. I read the other day that already carpenters and other workers are walking the streets looking for work in some cities. Building permits were down more than a third for the first quarter of this year as compared to last. And yet thousands of people are looking for places."

"You would think the building industry would wake up to the fact that there is trouble ahead," Electra mused.

"The responsible people have," I commented. "A couple of the contractors with whom I talked were really apologetic about the prices they quoted. But they blamed conditions on the suppliers and on the workers. Lack of materials and multiple-time work are the big factors in high costs according to them. Scarce materials can only be had at exorbitant prices through gray market channels. And in some crafts Saturday and Sunday work at double time is demanded as a condition for working at all.

"Apparently it never has occurred to some people that a really bad slump in the building industry could touch off another depression. Take the electrical business for instance. Every one of those unbuilt homes would have required a range, refrigerator, water heater, lighting fixtures and a host of other equipment. None of this will be sold. A backlog piles up, buying stops and pretty soon factories close down. It could get serious."

"But there ought to be a cure," Electra said. "We're going to build our place when prices become reasonable."

"Builders don't think construction costs can be reduced more than 10 or 20 per cent through anything short of a depression," I continued. "I hope that isn't true because it seems to me that there is an opportunity for a lot of cooperation to get prices down. Contractors can encourage better relations with labor by letting workers know they have a stake in every job. Materials can be specified that are available. They can use modern processes and equipment and if labor kicks, they can fire someone.

"The craftsmen themselves can stop jurisdictional disputes. They can train more apprentices. They can be satisfied with a 40-hour week without overtime. They can eliminate 'featherbedding' and all practices that restrict productivity. They can give an honest day's work for a day's pay.

"As a matter of fact some of the unions are seeing that this is done. Down in southern California one union has kicked out a lot of members for inefficiency."

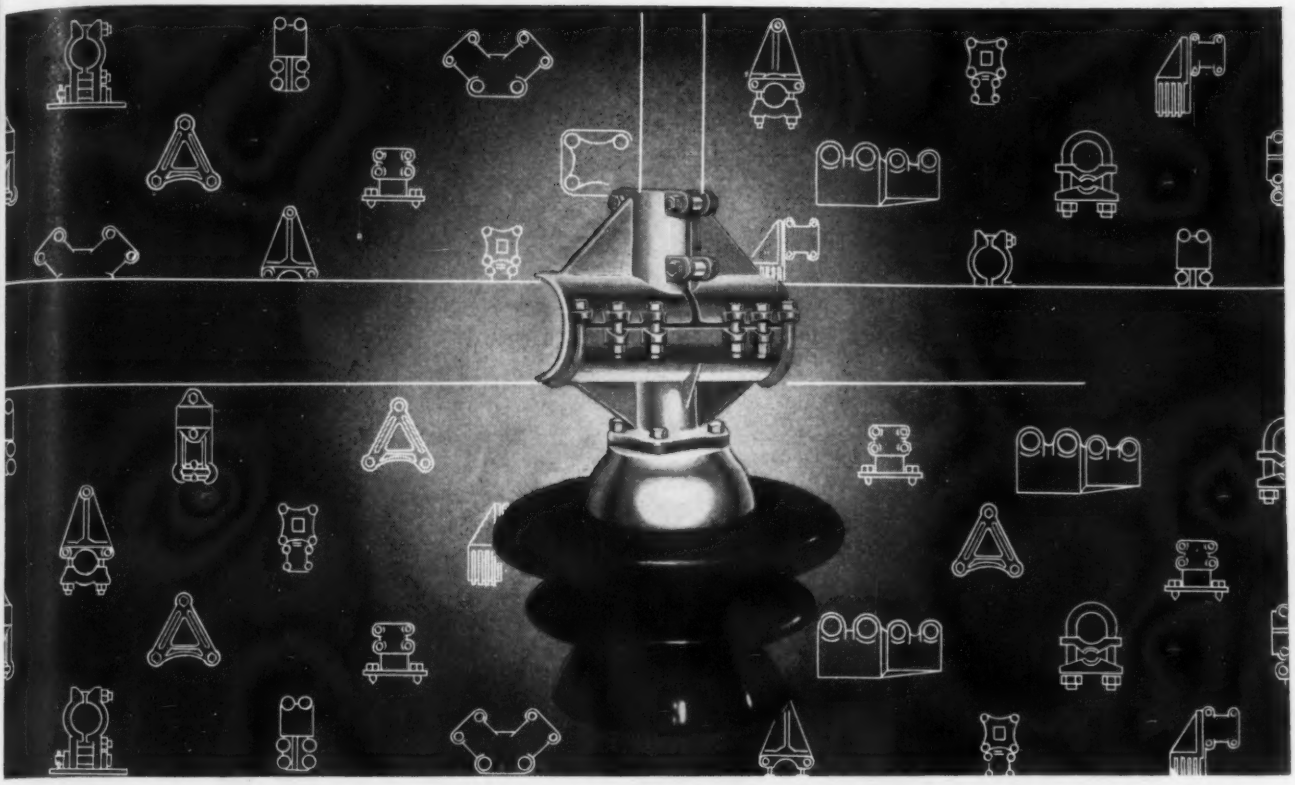
"But what does all of this mean to us?" Electra asked. "What are we going to do for a place in the country?"

"Well I saw an ad in one of the papers that the government is selling Quonset huts over at Camp Stoneman," I replied. "They are asking $250 for a 20x45-ft. building."

"I'd rather live in a trailer," Electra said. "Let's wait until we can build the kind of a place we want."

"I'm afraid it will be a long, long time," I said.

"You'll probably be surprised," she said, ending the conversation.



EQUIPMENT *You* HELPED TO DESIGN

SOUTHERN STATES' complete line of power connectors, bus supports and bus support clamps, both indoor and outdoor, are designed in hundreds of variations to meet problems **you** asked us to solve. From complex combinations of connectors with bus supports and clamps for several busses, to simple connectors, **you** helped us build this entire group.

SOUTHERN STATES' connectors and fittings are cast of high conductivity bronze, for all shapes, sizes, and combinations of conductors.

Whatever your requirements, however complex your problems of design, **Southern States'** engineering know-how can meet them. In **Southern States**, the finest manufacturing equipment is combined with the ability of men who have practical field experience in the power industry to develop products that are best . . . by **your** test! **Southern States** engineers invite your inquiries concerning any types of designs in fittings and connectors needed on your job.

WRITE TODAY for a complete description of the entire line or send us details on your current connector problem.

Address your inquiry to Box 473.

Southern States Equipment Corp.

HOME OFFICE AND FACTORY — **HAMPTON, GEORGIA**

REPRESENTATIVES IN FOLLOWING CITIES:

BIRMINGHAM, ALABAMA
LOS ANGELES, CALIFORNIA
SAN FRANCISCO, CALIFORNIA
DENVER, COLORADO
WASHINGTON, D. C.
JACKSONVILLE, FLORIDA
MIAMI, FLORIDA
ATLANTA, GEORGIA
EVANSVILLE, INDIANA
VALPARAISO, INDIANA
LOUISVILLE, KENTUCKY
SHREVEPORT, LOUISIANA
BOSTON, MASSACHUSETTS
JACKSON, MICHIGAN
KANSAS CITY, MISSOURI
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CLEVELAND, OHIO
PHILADELPHIA, PENNSYLVANIA
PITTSBURGH, PENNSYLVANIA
CHARLESTON, SOUTH CAROLINA
KNOXVILLE, TENNESSEE
MEMPHIS, TENNESSEE
DALLAS, TEXAS
HOUSTON, TEXAS
LUBBOCK, TEXAS
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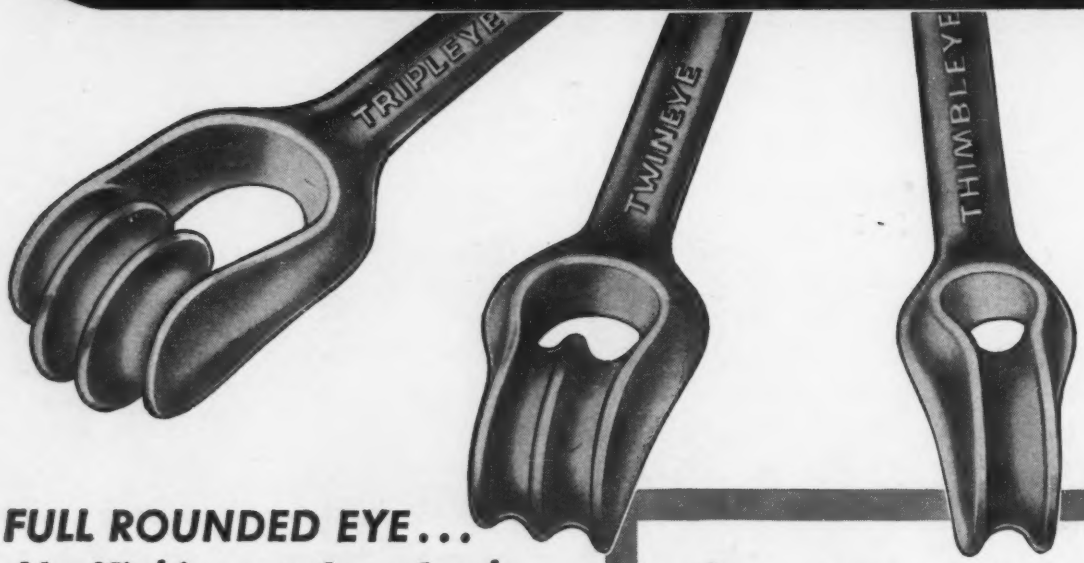
CHANCE Improved THIMBLEYE
Gives GREATER Protection to Guy Strand



FULL ROUNDED EYE...
No Kinking at Any Angle
GROOVED to Fit Guy Strand

Chance Thimbleye Anchor Rods, and Guying Fixtures, the FIRST choice of users for many years, have recently been improved by Chance engineers. The redesigned eye forms a perfectly shaped "Thimble" and the sidewalls and groove of the eye extend around the head of the rod. This keeps the strand from flattening under tension, preserves its cylindrical shape and *prevents it from kinking* at any one point. The sidewalls of the groove are formed to fit snugly around the guy strand, preventing it from flattening under tension.

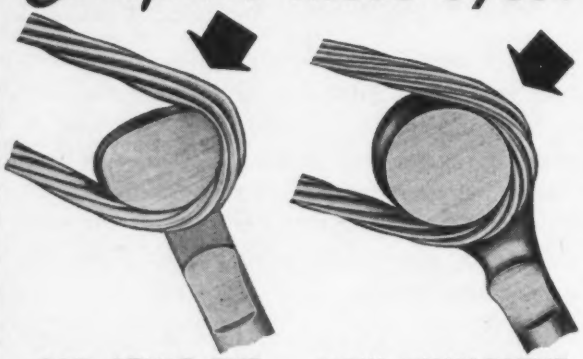
You will instantly see that the newly designed eye gives greater protection to guy strands than the old style eye.

The Improved Thimbleye is available in threaded rods, Never-Creep rods, and the complete line of guy fixtures.

For greater line security, specify Chance Thimbleye Anchor Rods and get this additional protection. Order through your regular source of supply.

Chance Thimbleyes are manufactured and distributed by the A. B. Chance Company and the following manufacturers: Joslyn Mfg. & Supply Co., Chicago, Illinois, Line Material Co., Milwaukee, Wisconsin, Oliver Iron & Steel Corp., Pittsburgh, Pennsylvania, Kortick Mfg. Co., San Francisco, California, Seyler Mfg. Co., Pittsburgh, Pennsylvania, Locke Insulator Corporation, Baltimore, Maryland, N. Slater Company, Ltd., Hamilton, Ontario.

Compare these eyes!



OLD STYLE EYE

Notice the strain placed on guy strand when used at angle with old style eye.

NEW THIMBLEYE

The new Chance Thimbleye *protects* the guy strand from strain at any angle.

Diagram at left shows how the guy strand is supported and protected by the snug-fitting sidewalls of the groove, which extend all the way around the head of the rod.

C473A

A·B·CHANCE CO·

CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA

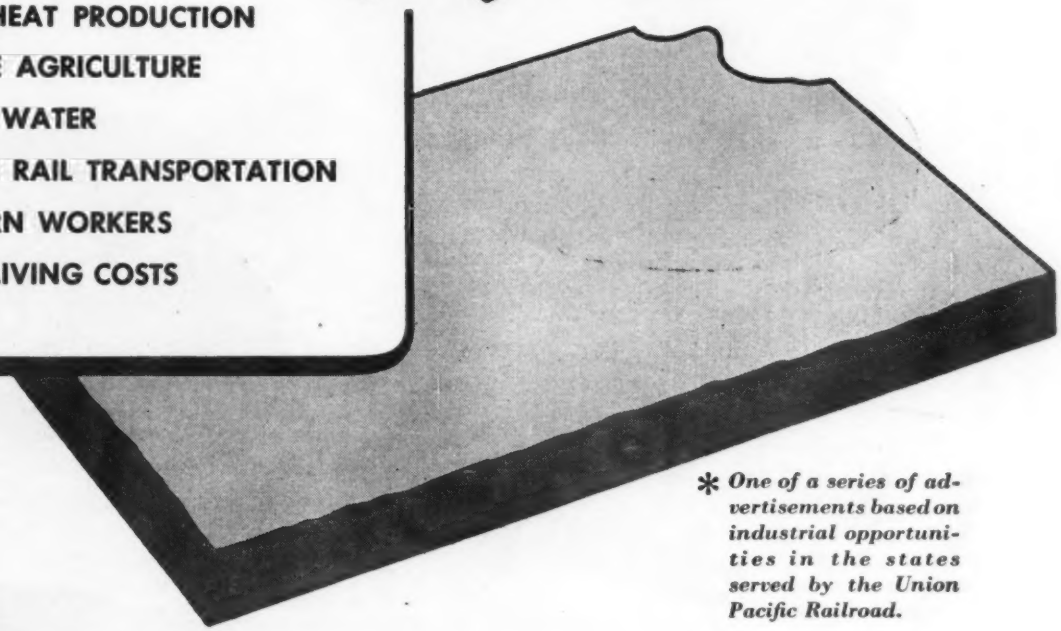
abc INDUSTRIES

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Kansas *

RICH NATURAL RESOURCES
CENTER OF NATIONWIDE MARKET
PROGRESSIVE INDUSTRY
FIRST IN WHEAT PRODUCTION
PRODUCTIVE AGRICULTURE
ABUNDANT WATER
DEPENDABLE RAIL TRANSPORTATION
NATIVE BORN WORKERS
MODERATE LIVING COSTS



* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

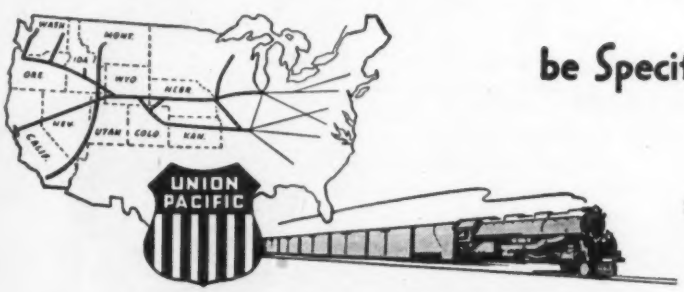
KANSAS—almost in the exact geographical center of the United States; an important factor to industries serving nationwide markets.

Agriculture is king. Kansas normally ranks first in wheat production. In addition to grains, vegetables and fruits, a large part of farm income is derived from livestock and poultry.

Kansas industry keeps step with agriculture. There are approximately 2,500 manufacturing and processing establishments. Over four million tons of coal are mined annually. Here is the largest natural gas field in the world. Eighteen principal rivers with two great watersheds provide an abundance of water. The population is 97 per cent native born.

★ ★ ★

Kansas . . . the hub of a rich market; a treasure chest of natural resources with dependable labor; outstanding public health record; moderate living costs; and excellent transportation over Union Pacific rails.



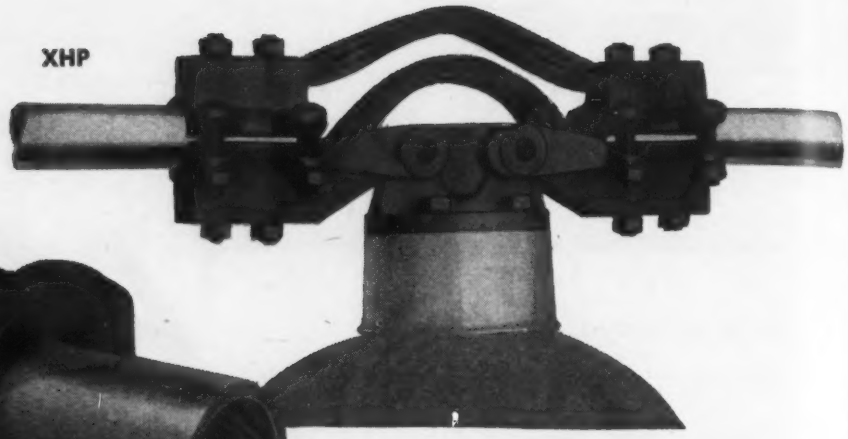
be Specific – say

"Union Pacific"*

* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

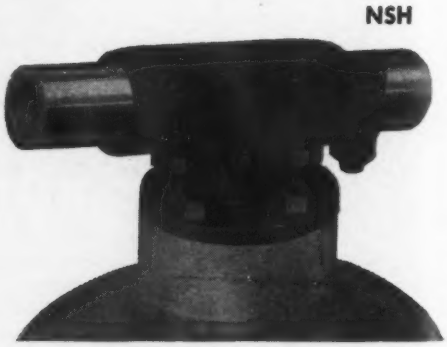
UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE



bus support clamps

by BURNDY



Bus support clamps are important, too!

The bus support clamps illustrated here, and others in Burndy's comprehensive line, were all designed to meet rigid utility requirements, both mechanical and electrical.

They are available for supporting all sizes of tubing, flat bar and cable, in both 3" and 5" bolt circle mountings. *Fitting companions to other Burndy station connectors, such as T's, couplers, expansion joints, etc.*

It will pay you to specify "Burndy" on your next substation. You'll find a complete listing in your connector bible – Catalog 40.

BURNDY • New York 54, N. Y. • Western Branch: Vernon 11, Cal. • Canada: Canadian Line Materials, Ltd., Toronto 13 • Foreign: Philips Export Corp., N. Y. 17

JULY 1947 Vol. 99, No. 1

ELECTRICAL WEST

A UTILITY SALES POLICY

From a talk before the Pacific Coast Electrical Assn., Business Development Section, at Riverside, California

George N. Hawley
Southern California Edison Co.

SO USED has the American public become to the attack method in speech and writing that a calm discussion of the evolution of sales policy is likely to be flatter than last night's beer. For evolution is history, and history, to our hopped-up generation, is something the world has had too much of.

Nevertheless, as essential components of a great industry, we would be less than alert if we failed to note and correctly to appraise the gradual crystalization of thinking which has been going on with respect to utility sales policy. I do not mean to imply that the process is by any means complete or that anything like unanimity has been achieved throughout the industry, but there can be no doubt that the main form of our sales future can now be generally recognized.

It is safe to say that for the first fifty years of its existence, the industry had absolutely no fundamentel sales policy. By that, I mean that the utility business as a whole had never fully made up its mind whether it ought to sell or not and if so, what basic plan it should pursue. The reason for this indecision, as I take it, was that the industry was confused as to what utility selling really is. As a result, one experiment after another in selling was undertaken and the experience gained from these constituted the sum total of sales policy until shortly before World War II. Some of the experiments ended disastrously, as experiments sometimes do, and the number and variety indicated the confusion of thinking which existed.

It was not just a fortunate turn of circumstance that saved American utilities from the fate of their European cousins. Following the lead of the railroads, this industry seemed hell-bent on conducting itself in such fashion as to end up in the hands of the government. Prior to 1925 the cornerstone of utility policy in America was that this industry was a quasi-public monopoly whose commercial organizations were simply tax collectors and whose rules had all the effect of law. The net result was that one municipality after another decided to go whole hog and make their utilities completely public institutions. What saved the day for free enterprise in this business was the growing realization on the part of some of its longer-headed leaders that this industry could not remain half slave, half free. To think and act as a public monopoly meant just one thing —we soon would be in that category. To survive as an integral part of the free enterprise system meant a tremendous redirection of thinking, and a complete re-equipping of the industry with all the trappings of modern private business.

Faced with the same choice, European utilities took the other road and fell completely under political domination. No clearer demonstration of the basic mental attitude of the old world versus the new exists in all of history. The comparative records of the two systems today show how fortunate the American public is that its utility leaders decided to work and fight on the side of private enterprise. Can you imagine a system under which the whole of industry is operated on the private plan, except the utilities which are public monopolies?

What was that resurgence of thinking within the industry that put this business on the American plan? It was the realization that there are two ways to get people to take action. One is by law, the other is by personal influence. I pay my taxes because I am compelled to do so. I buy my Coca-Cola and my Lucky Strikes because personal influence makes we want them more than the money, Now stripped of all its funny business, salesmanship is simply personal influence; and advertising is personal influence extended.

So it was that when the industry decided to put off the cloak of compulsion lest it become the uniform of the government, it was salesmanship that was relied upon to advance and protect the business. With that shift of thinking, the supplying of electric power avoided falling into the category of street and sewer service and became a full-fledged American business enterprise. With that fundamental decision made, the process of re-equipping the industry with the mechanisms for extending personal influence went forward and the period of sales experimentation began.

Now I may have spoken of this shift of thinking as though it all had happened at one time and was accompanied by general acceptance throughout the industry. In so vast and widespread a business no such unanimity can be achieved with any immediacy. It has been relatively a short while since the definite outline of the problem appeared and the realization of the answer has spread gradually over the face of the industry. That's why we speak of the evolution of sales policy and say that the process still continues. Here and there, remnants of the old thinking still persist. In the main, they are evidences that the confusion as to what utility selling is for, still lingers. They are holdovers from the days when the industry decided it had to sell but didn't know how.

Utility selling in the broadest sense embraces every situation in which it is desired to influence a customer. Thus it is by no means confined to the process of getting Mrs. Customer to buy a lamp or a range. The task of convincing a customer that his bill is correct is a sales job. The task of getting a customer to take service at the proper voltage is a sales job. The task of getting a customer to install power factor correction is a sales job. The task of convincing a customer that his utility is well managed and highly efficient and that the service it renders is a bargain at the price is a sales job. Looked at in this light, every employee who contacts customers is a salesman

who should have sales training. That goes even for the chap who turns the lights off when the customer doesn't pay his bill.

We spoke of the era of sales experimentation. Those early experimenters in utility selling borrowed their technique largely from the merchandising field. There were no other sources and the concept of selling so intangible a thing as service—of becoming the exponent of an idea—had not yet been formulated. As a result, at one period the concept of utility selling became synonymous with appliance merchandising, an idea which still persists in some minds today.

Discontinuance of direct merchandising by a large majority of utilities in the country does not mean that the industry has lost faith in the selling process. Rather it means that better methods are demanded, methods more adaptable to the peculiar needs of the business.

Those critics of utility selling who are still left over from former days generally fall into one of two classes. Either they view the operation as unnecessary or they believe it unable to accomplish its announced purposes. In the former category is Argument A. It runs like this:

"A utility is a regulated monopoly. An increase in gross income resulting from sales effort merely means that more and greater rate reductions will be required so that even if you are successful the company can't make any more money and the activity defeats itself."

Those who advance this argument expose their ignorance of the part that selling plays in the American economy. The social significance of selling is not that it extorts money, but it releases the benefits of mass production. The cycle of increased sales — increased production—lower costs—higher quality and lower prices is peculiarly American. The fact that we are dealing with regulated utilities does not alter the basic economies involved. After all, the ultimate aim of good regulation is to provide as close a substitute for competition as can be found so that the argument applies with no more force to the utility than to the shoe business or any other. Consciously or otherwise, the net effect of increased sales volume in American business is to give the customer more for his money. That's exactly what we mean by a rising standard of living.

Argument B in the same category runs like this:

"The thing that determines sales volume in a commodity like electricity is not sales effort but price. To get volume you've got to lower the price and if you lower the price you don't need sales effort."

Well, the best answer to that one is that it has had a ten-year trial and it failed miserably. Listen to this theory expounded in the brave words of the annual report of the Tennessee Valley Authority for the fiscal year ended June 30, 1936:

"What was needed was an actual demonstration (1) that the electrical power industry had become involved in a vicious circle of high prices and low consumption, and (2) that there was a means of escape from this predicament. The difficulty was, despite a gradual increase in power consumption, and despite also a gradual reduction in retail rates, that electricity was still too expensive to be widely used. The utilities do not think it advisable to make drastic rate cuts in advance of wider use. The consumers' on the other hand, would not buy additional current in large amounts, or would not buy current at all at the then existing rates.

"To the Authority the solution of this stalemate seemed to be to apply to the electrical industry the principles of mass production and mass consumption which had proved successful in a number of great private industries in America. The essential element in mass production is a progressive decrease in unit cost—the more items of any commodity a producer turns out, the less each item is likely to cost him. There are limits to this law of diminishing costs, but the electrical industry is a long way from having reached them. Similarly, the essential element in mass consumption is that the cheaper the article is, the more the consumer can buy, Here, too, there is a limit to the law, but in the case of electricity it is not likely to be reached for a long time."

There you have a beautiful example of cart-before-horse thinking. All the elements of a great business are there except sales. The net result of the application of that theory is that TVA proceeded to lose the taxpayers' shirt.

In the second category comes Argument C. It runs something like this:

"Since the beginning of the war, utilities have done mighty little selling in the domestic field. In spite of this, kilowatt-hour usage per customer has broken all records and annual revenue per customer is at the highest point in history. That proves that selling doesn't influence volume."

Well, let's take a look. A fair comparison would be to stack up utility sales without sales effort against sales of some other businesses which didn't lay off selling. Since 1940 residential kilowatt-hour sales increased from 952 per customer to 1,329 or 40%. Cigarette sales in the same period jumped from 1,400 per capita to 2,200 or 57%. Residential income per customer, however, increased from $36.56 to $42.79, an increase of 17% in money whereas due to price movements, cigarette income per capita was up over 75%. Total retail sales per capita hopped from $352 to $686, that's 95%—nearly double. Even with the restrictions which all business faced during the war, it looks as though on the average other businesses boosted sales volume about twice what utilities did. Our increase hardly kept pace with the declining purchasing power of the dollar.

So much for the few remaining doubts about utility selling. These are the evidences that the conversion of thinking within the industry is still not complete. These are the signs that selling itself still must be sold. These are warnings that sales people must explain and demonstrate their techniques in order to win complete understanding and acceptance.

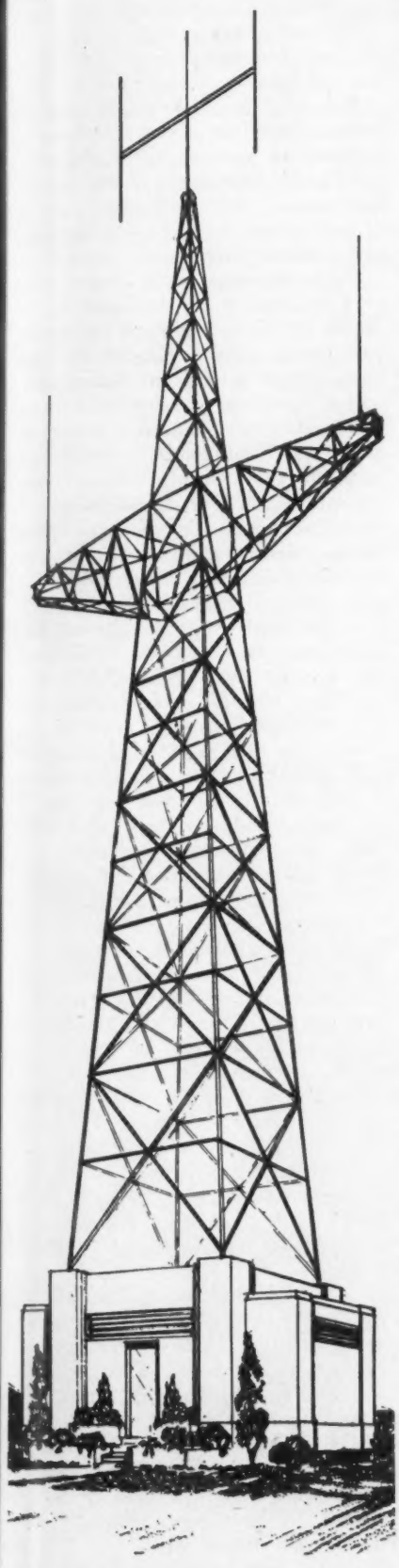
For the past five years, this industry has been heavily preoccupied with the technical details of rendering service. In many respects the mental status of the entire business has been much like that prior to 1925. Without discounting the many serious difficulties confronting our operating colleagues, it is time to think rationally about sales. In the past sixty days American business has taken a decided nose dive. The buyers' market which our economists have been expecting now seems to have been with us for some time. Already our kilowatt-hour index per customer has been affected. A buyers' market is a normal market in America. Controlled by sales effort, it is the mainspring of free enterprise. To keep this industry in the free enterprise column, its sales leadership must be regained.

The modern concept of utility selling is not based on borrowed techniques from other fields of sales or merchandising, but rather upon methods designed to fit the peculiar needs of this business. To become the foremost exponents of the virtues of electrified living, electrified farming and electrified manufacturing, we have had to back up our faith in our product with solid know-how in its use. The best sales tool is a good working knowledge of the customer's business. The techniques of demonstration and testing and consulting have become the methods of extending our influence. Courageous championship of our product calls for more than courage — it calls for knowledge, intimate knowledge, of the uses of electricity. This is especially true in the commercial and industrial fields. This then is the present status of sales policy in this business. It is the result of trial and error, of experiment and failure. It is the process of evolution at work in a great industry.

EXPERIENCE IN THE 70 MEGACYCLE BAND

With the advent of new FCC rules, radio has become an essential part of power system operations. Here is what Portland General Electric Co. found out about available bands and reported to the Northwest Electric Light & Power Association. Participating with the author in the tests were N. P. Ashworth and A. S. Renie, both of Portland General Electric, and J. E. Balint of Link Radio Corporation

W. A. Leidigh, Jr.
Portland General Electric Co.



KAZJ as visualized by designers. Tower rises to 97 ft. above ground level. At top is 75.5-mc. three-element directional array. Arm carries 30-mc. coaxial non-directional and auxiliary antennas

Simplifications in Federal Communications Commission rules concerning power utility radio have made radio dispatching networks an essential part of virtually every power system. This development, including FCC allocations of very high frequency bands, together with the arrival of frequency modulation may introduce general value into recent radio experience, resulting from both tests and operations by Portland General Electric Co.

The system is now engaged in installing a 250-watt, fixed FM transmitter and 54 two-way mobile units, to operate in 75.5 mc. The decision to install this equipment and eventually to convert all system radio to 75.5 mc., FM, is the result of experience with a variety of fixed and mobile units.

In 1939, FCC authorized Portland General Electric to operate a special emergency radio network. One 50-watt, AM transmitter, operating on 2,292 kc. was first installed, together with various mobile equipment, operating on 2,292 kc. and 31,740 kc. A remote receiver was installed at Council Crest within the Portland city limits, with an antenna altitude of 1,100 ft. This was subsequently augmented by a second remote receiver at Rocky Butte, antenna altitude 600 ft., on the opposite side of the city. Later, a Link Radio 400-watt AM transmitter (KRKX) operating on 31,460 kc. was installed at a hydro plant at Three Links, Ore.

At present, KRKX on 31,460 kc., 21 General Electric two-way AM mobile units on 31,740 kc., and fourteen Link Radio two-way FM mobile units on 33,820 kc. are working into the KQEB network. Installation of AM mobile transmitters was discontinued as soon as FM mobile equipment became available. Although the mixed network has presented technical problems by exposing dispatchers to noise troubles of two different mobile talk-back frequencies, the program has paid out with better system coverage.

Regular and quite dependable contacts up to 50 mi. are made with FM mobile units when they are able to maneuver to a good receiving location. The weak point in the network is obviously the medium frequency AM link from the dispatcher to the car, and it is in this direction that most emergency calls are transmitted. Noise conditions, especially in summer, make operation in the vicinity of high-voltage transmission lines practically impossible at distances over 10 mi. from the fixed transmitter.

30-mc. Band vs. 70-mc. Band

Nearly seven years' experience has been accumulated monitoring one fixed-station channel and two mobile channels in the 30-mc. band on a 24-hour basis. The mobile channels have been kept clear of the more powerful fixed stations by FCC regulations and are still usable without excessive skip interference. Although distant mobile unit transmissions are heard at times under skip conditions, the lower power operation and low antenna efficiency tend to keep this interference to a tolerable level.

As the fixed station channels became more congested, however, with relatively powerful transmitters on or near the East Coast, skip has made them practically useless for this class of service. During the past year these channels are consistently jammed from sunup to sundown with as many as three stations at once. Signal levels higher than those from local mobile

Mobile 70-mc. station in passenger car utilizes 37-in. antenna mounted atop car

units are received; therefore, heavier squelch control at remote receivers cannot be used.

Out of some 30 stations logged and consistently heard on the fixed station frequency of 31,460 kc., none have "K" calls. Their locations vary from Chicago to the East Coast, and certain groups are heard at different times.

Under present conditions on 30-mc. channels, a workable two-way radio network must either utilize two frequencies or use a selective call system. In the first case, a mobile frequency is used for the car talk-back and a fixed-station frequency used for the main transmitter as required. Thus, the system operator is monitoring a comparatively clear channel and the mobile units, because of their location, are not exposed to as much skip interference. Car-to-car contacts are not possible with such a network, which is a considerable disadvantage. In the second case, where selective call is used, first cost and maintenance cost are increased.

It appears that the FCC intends to improve this condition by reallocation of frequencies according to geographical area, when permanent assignments are made for this class of service.

Considering the above outlined conditions in the 30-mc. band, the company decided to delay its radio network expansion until assignments in the 70-mc. band were made. Skip conditions at these higher frequencies is not considered serious, and other advantages such as shorter mobile antenna and more practical mechanical construction of directional arrays are very favorable from the operating standpoint.

Comparative Tests

With the cooperation of John E. Balint, at Link Radio Corp., two Link FMTR Ed 7B 73.7-mc., 50-watt mobile transmitters with combined receivers were made available for conducting tests. The object to determine whether 73.7 mc. would do as well as 30 mc. in remote districts up to 50 mi. from the fixed transmitter.

Portland General Electric's service area covers approximately 2,500 sq. mi., and the main dispatching point is located at Portland in the extreme northern part. It so happens that the boundary of this territory conforms remarkably to the pattern of a vertically polarized, three-element antenna array when oriented 15° west of south from the city of Portland.

The summit of Mt. Scott near the city limits of southeast Portland was used for the fixed location in the 30-mc.-70-mc. comparison tests. The site had been previously selected for its excellent system coverage on 30 mc. Mt. Scott has an altitude of 1,080 ft.; the summit covers a small area of approximately 30 acres, and the terrain falls off quite rapidly in all directions.

A Link 4CA-D, 3-element array was connected to the 50-watt, 73.7-mc. mobile transmitter, thus producing a directionally radiated power of approximately 200 watts. With the cooperation of Northwestern Electric Co., KBPB, operating at the same point on Mt. Scott with a non-directional power of 250 watts on 39.86 mc., was used for the 30-mc. tests. Although some theoretical power advantage was given to 30 mc. for the comparison test, it was considered negligible.

Two test cars, each equipped with units adjusted to one of the above two frequencies, covered some 450 mi. of the Portland General Electric distribution system. Although the maximum communication coverage requirement is 50 mi. air line south, several comparison tests were made in the vicinity of Corvallis, at an air line distance of 72 mi. from the fixed transmitter. Test points such as substations, transmission line routes, and distant metropolitan areas were selected. First-limiter grid-current readings were noted at all test locations only for the purpose of establishing relative signal strengths and coverage area of solid signal. The tests were made during August and September 1946, under summer high-level noise conditions, and over 100 readings were recorded.

In no case where a call was made either way on 39.86 mc. or 73.7 mc. was contact not established, even at the 72-mi. points in the metropolitan area of Corvallis. Some noise in background was noticeable at this distance, with signal strength readings varying considerably in different locations. The 73.7-mc. signal was easily understood, while the 39.86-mc. signal had considerably higher background noise.

To cover the results of the tests with a minimum of detail, it can be positively stated that solid coverage up to 40 mi. air line to any point on the company's distribution system can be expected with either frequency. The term solid coverage in this case is applied to communications without noticeable noise and with mobile-receiver squelch settings heavy enough to hold the receiver quiet throughout transmitter off periods.

In the 40- to 50-mi. range, signals on both frequencies were consistent and quite strong, but background noise especially on 39.86-mc. came up to noticeable levels. Spotty conditions in metropolitan areas at these distances were observed; this effect was more marked on 73.7 mc. than on 39.86 mc., but in no case did either signal disappear completely.

Line of sight conditions did not prevail. Hills and obstructions close to the mobile talk-back transmitter appeared to have more shading effect than much larger obstructions 5 mi. or more away. This phenomenon and its importance in selecting a fixed station site has been noted elsewhere.*

Last December, FCC granted us per-

* *FM and Television Magazine*, Jan., 1947; *Electrical World*, Feb., 1947.

mission to construct a 250-watt fixed transmitter (KAZJ) with directional antenna on the summit of Mt. Scott. An operating frequency of 75.5 mc. was assigned and construction of up to 95 associated mobile units was authorized. A Link Radio fixed transmitter and 54 two-way mobile units are now being installed.

KRKX at Three Links will be cut over to the new frequency and the fixed station channel at 31.46 mc. will be dropped. The network will then be relieved of the severe skip interference on this channel.

The main fixed station KAZJ on Mt. Scott will be housed in a concrete building with a self-supporting steel antenna structure mounted on the top. The main antenna will be 97 ft. above ground level and over 1,100 ft. in altitude.

Considerable study was given to the floor plan and conduit installation so that concealed wiring facilities would be available for additional units such as relay transmitters and other automatic equipment. A Kohler 5-kw., Model 5E61 automatic stand-by plant will supply power in case of line failure. Both power and telephone circuits enter the building through underground cables with large wall junction boxes provided for terminating equipment.

In order to minimize the possibility of interference from the several FM and future television broadcasting stations in the vicinity, a heavy and direct ground was installed. All reinforcing steel was welded at every tie point and connected to the ground system with brazed copper bonds.

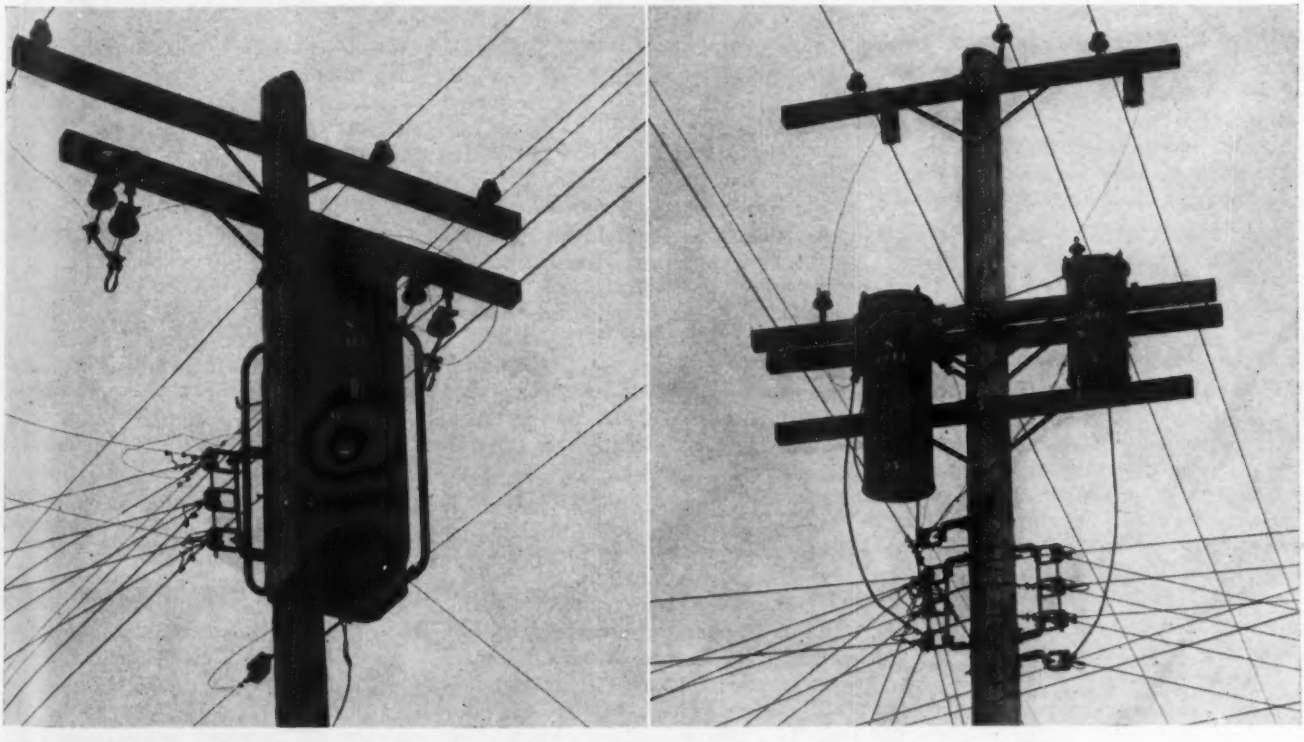
One FM broadcasting station with an effective radiated power of 250,000 watts will be located within 1,000 ft. of the KAZJ antenna. The result of such a heavy field and possible radiation from the station's multiplying stages cannot be predicted, but serious trouble is not expected unless combinations of various hetrodynes happen to fall within the frequency-acceptance range of the receivers required at KAZJ.

Of the fifty-four 75.5-mc. mobile unit installations associated with the KAZJ network, approximately 80% will serve emergency and line trucks. These units will be equipped with a fender projection speaker so that calls can be heard within working range of the truck. The shorter antenna for 75.5 mc. (37 in.) as compared with the 7-ft. whip required for operation in the 30-mc. band, simplifies installation, especially on trucks where clearance is limited. All two-way installations will be powered with a group-4 battery and where required, the new a-c, rectifier-type, high-output generators will be installed.

Fixed-station controls are being provided at six different locations. Central-office and field-office departments in different locations, and operating two-way cars, will have direct access to radio network facilities. All land lines from these controls, including those from the fixed transmitter and remote receivers, will terminate at the radio maintenance laboratory. Receiver channels on all network operating frequencies are mixed and amplified at this point and a certain amount of monitoring during working hours will be undertaken.

The combined multi-frequency KQEB-KRKX-KAZJ mixed AM and FM network will in time be simplified to single-frequency operation at 75.5 mc. by retiring units which are now in use and becoming obsolete.

TWO-IN-ONE TRANSFORMERS KEEP POLES TRIM



Transformers incorporating two core and coil units of different size in a single case are used by Washington Water Power Co. for open-delta or open-wye primary connection on distribution poles in place of two individual transformers where small three-phase power and lighting are supplied from the same bank. Initial cost is slightly higher than the cost of two conventional units, but Washington Water Power figures the over-all cost is less, by virtue of savings in cost of crossarms, hardware and labor. Furthermore, the appearance of the pole is greatly improved. At right is a conventional installation; at left a single-case unit by Line Material Co., which introduced such a development several years ago. Typical combinations are 5-25 kva., and 10-37.5 kva. WWP has no difficulty in stocking these

PRESERVING POLES

Two viewpoints presented to the PCEA on a problem made currently vital by shortages

TREATING WITH OIL MIXTURES

Dan L. Lindsley
J. H. Baxter & Co., Los Angeles

Since the war, the wood preserving industry has had to contend with an uncertain and inadequate supply of creosote. Although the war's end terminated many demands for preservative treatment of timber products, they were replaced by an avalanche of accumulated peacetime requirements. At the same time, importations of creosotes, cut off completely in the early days of the war, have been renewed to only a very limited extent. Importations in sufficient amount to meet the needs of our industry, when added to our domestic production, do not appear likely in the immediate future.

Coupled with a shortage of creosote is a record demand for poles.

Dilution of creosote with petroleum, both fortified and unfortified, is one of the methods adopted by the industry to meet this situation. By fortified is meant the addition of chemicals of known toxic value to the petroleum portion of a creosote-petroleum treating mixture in such percentage as to make the petroleum portion comparable in toxicity to the creosote being used. Pentachlorphenol and copper naphthenate have been most frequently used for this purpose.

Our company, for example, has, for the past year or more, been using pentachlorphenol as the fortifier for the petroleum portion of its creosote-petroleum mixture treatments of poles. It is used in the amount of 5% by weight of the petroleum portion. Creosote has been added in an amount not less than 15% by volume of the total mixture. Our present mixture, at our Long Beach plant, contains 50% by volume of creosote.

Some suppliers are now furnishing straight petroleum-penta treatments with no creosote, and others are using creosote-petroleum mixtures with no fortifier. Both these extremes are accepted by the users, having been first approved by the Bell Telephone Laboratories for all of its operating units and by the Rural Electrification Authority for all lines built with REA funds.

Laboratory tests on the toxicity of pentachlorphenol to various types of wood-destroying fungi indicate that it has about twenty times the inhibiting and killing power of the No. 1 coal-tar creosotes used in these same tests. Hence a 5% concentration of penta in a neutral petroleum oil will give a toxicity to the mixture about equal to that of the creosote portion of the treating solution. The petroleum oils used in these mixtures must be high in aromatic content in order to provide good solubility for the penta, and these aromatic fractions are of themselves toxic to wood-destroying fungi.

In the foregoing, fortified creosote-petroleum mixtures have been emphasized, although mention has been made of plain creosote-petroleum treatments for poles. As stated, these unfortified mixtures have been approved by many of the large pole users and are now being furnished by some of the suppliers. Unfortified mixtures are permissible under the present A.W.P.A. treating standards. Paragraph 4.2 of the current A.W.P.A. Standard Specification 51a, covering preservative treatment of Pacific Coast Douglas fir poles by pressure processes, provides for the use of creosote-petroleum solution. Action was taken at this year's convention of the American Wood-Preservers' Assn. in Portland, whereby creosote-petroleum solution was added to paragraph 3.21 of this same specification.

This is the paragraph providing minimum retention of preservative, which, in the case of Douglas fir poles, is 8 lb. per cu.ft. A.W.P.A. Standard 63b, covering creosote-petroleum solution, provides a minimum of 50% by volume of creosote in such solution. Thus the unfortified creosote-petroleum treatments now being used are usually 50-50 mixtures. In no case, of which I am cognizant, is less than 50% by volume of creosote being furnished.

An important aspect of pole treatment is density of preservative in the treated area. Many have come to regard it as a better gage of protection than retained poundage.

In the treatment of Douglas fir poles, for example, an 8-lb.-per-cu.ft. retention results in greater preservative concentration in the treated area of the larger sizes, assuming the sapwood thickness to be the same. This is a fair assumption as the sapwood thickness varies but little in Douglas fir regardless of size. Such variation of preservative density results in similar variation in degree of protection. This is not desirable, because economic design of a line as a whole requires that all poles in the line have equal life expectancy.

Not only does preservative concentration vary with size of a given pole species; it also varies among species. Southern yellow pine, for example, has a sapwood thickness about twice that of Douglas fir. The fir sap ring will average around 1½ in. in thickness as compared to a 3-in. average for Southern pine.

Let us assume that an 8-lb. empty cell treatment on a 30-ft. Class 5 Southern pine pole results in a satisfactory density of preservative in the 3-in. sap ring. This, in fact, is the assumption used by Pac. Tel. & Tel. Co. engineers in studies made in 1940. The A. T. & T. Co.'s long and extensive experience with Southern pine poles had confirmed this assumption. The size was selected because it represented the average of many thousands of poles in their system. To provide a comparable density in the 1½-in. sapwood of Douglas fir would require but 5 lb. of preservative per cu.ft. Throughout the range of classes and sizes, retention in Douglas fir will vary from slightly less than 3 lb. per cu.ft. of total volume for a 90-ft. Class 1, to about 6¼ lb. for a 20-ft. Class 7.

The attainment of these low required poundages presents another problem, especially in the treatment of Douglas fir. Adequate penetration cannot be attained when treating Douglas fir with such low retentions. Although these poundages are all that are necessary for preservative protection they are not sufficient to permit adequate penetration. Such being the case, why not dilute the preservative, with a petroleum oil for example, and use sufficient pounds per cubic foot of this mixture

to result in the penetrations desired? The theoretically correct mixture for treating a charge of 30-ft. Class 5 Douglas fir poles would contain 5 parts by weight of creosote and 3 parts by weight of petroleum. An 8-lb. net retention treatment with such a mixture would leave in the pole 5 lb. of preservative per cubic foot for protection, while the additional 3 lb. of low-cost petroleum would provide the means for securing the necessary penetration.

Table I is a compilation of the minimum pounds per pole and the minimum pounds per cubic foot of entire pole volume required for the various classes and lengths of Douglas fir poles to provide a treatment equivalent to that resulting from a 5 lb. net retention per cubic foot of total pole volume in a 30-ft. Class 5 having 1½-in. average sapwood. To derive these figures it is necessary to compute the volume of each class and length of pole, and the volume of sapwood in each at 1½-in. average depth plus end penetration volume, assuming 12-in. penetration at each end. The pounds required for a 30-ft. Class 5 divided by its computed treated volume, gives the required density of preservative in the treated area. This density, amounting to 8.25 lb. per cu.ft., is then maintained throughout the entire list of classes and lengths.

Let us see just what a 60-40 mixture will produce with an 8-lb. treatment. Treating plants usually mix by volumes rather than weights. Because of the difference in weight per gallon of creosote and petroleum oil, a 60-40 mixture by volume is equivalent to 64-36 by weight. An 8-lb. treatment with such a mixture will result in the retention of 5.12 lb. (.64x8) of creosote per cubic foot. Referring to Table I we find that this retention is sufficient or more than sufficient for all lengths in Classes 1, 2, and 3, for all but the shorter lengths in Classes 4 and 5, and for at least half of the Class 6 lengths.

As a matter of fact, the treaters of fir poles find it necessary to give the smaller sizes greater retentions than 8 lb. per cu.ft. in order to get satisfactory penetrations. As a result, standard treating plant practice, using an 8-lb. net retention specification with a 60-40 creosote-petroleum mixture, would provide ample preservative protection and penetration for all classes and lengths of Douglas fir poles.

For most pole sizes used for power purposes, a 50-50 mixture with an 8-lb. retention would be adequate. This treatment will result in a creosote retention of 4.32 lb. (.54x8) per cu. ft., which is sufficient for forties and longer in Class 5. If a 9-lb. retention is provided, Class 1 to 4, 25's, 30's, and 35's, and Class 5—35's, 40's and 45's are added to the list, which pretty well covers all the power pole sizes.

"How much less do mixture treated poles cost?" This is an important question, but must be answered with the reminder that creosote supplies may continue to be insufficient. Substitutions must therefore be made. Substitution through the use of fortifiers may not always be possible because some fortifiers have themselves already become scarce. So careful consideration of the straight creosote-petroleum mixtures seems wise.

Following is a calculation of savings by the use of creosote-petroleum mixture in lieu of straight creosote treatment. The figures are based on old OPA schedules of weights and maximum treating charges together with present-day freight rates and material costs. Comparison with creosote-petroleum-penta mixture treatments are not included, as the cost of such treating solutions is very little less than straight creosote where the creosote percentages are substantial, say 50% or more by volume. The following indicates the saving per pole, which would be the same for any delivery point as the item of freight would not be affected by the type of treatment.

50-50 MIXTURE, 8-LB. RETENTION

Pole Class and Length	Saving per pole
7-25′	$0.40
7-30′	0.50
5-30′	0.70
7-35′	0.65
5-35′	0.90
5-40′	1.10
4-40′	1.30
4-45′	1.55
4-50′	1.75
3-55′	2.30
3-60′	2.55
2-70′	3.85
2-75′	4.35

USER'S VIEW OF OIL MIXTURES

W. H. Seaman
Southern California Edison Co.

Creosote petroleum preservative mixtures have been recommended for consideration by pole users because: (1) their use provides a means of stretching the creosote supply; (2) by proper selection of the proportioning, wood treaters can maintain the same concentration of creosote in the sapwood of all sizes of poles; (3) first-cost savings are possible.

Such mixtures have been in use for years, so it is possible, in a way, to evaluate their place in the preservative field by examining the record of demand and past performance. The U. S. Forest Service in cooperation with the American Wood Preservers Assn. annually publishes a comprehensive report on quantities of wood treated and preservatives used. The last report available is for 1945, a year of very low creosote imports (approximately 2 million gallons). Average imports for the five years prior to the war were

Table I—Weights of Treatment in Douglas Fir Poles to Maintain 8.25 Density in the Treated Area

	Class 1		Class 2		Class 3		Class 4		Class 5		Class 6		Class 7	
Length	lb. per pole	lb. per cu. ft.	lb. per pole	lb. per cu. ft.	lb. per pole	lb. per cu. ft.	lb. per pole	lb. per cu. ft.	lb. per pole	lb. per cu. ft.	lb. per pole	lb. per cu. ft.	lb. per pole	lb. per cu. ft.
20′	52	4.5	49	4.7	43	5.0	38	5.3	36	5.6	34	5.86	28	6.22
25′	70	4.2	65	4.3	59	4.76	54	4.86	47	5.2	44	5.37	39	5.8
30′	90	3.96	81	4.26	76	4.4	67	4.75	60	5.0	55	5.2	49	5.6
35′	110	3.8	101	4.0	90	4.2	82	4.5	74	4.7	67	5.08	60	5.5
40′	130	3.6	118	3.9	104	3.92	98	4.3	88	4.66	80	4.88	70	5.26
45′	149	3.56	138	3.7	126	3.94	115	4.2	101	4.5	93	4.74	82	5.13
50′	172	3.4	157	3.65	145	3.8	134	4.01	120	4.3	107	4.63	97	4.85
55′	192	3.36	176	3.57	164	3.75	157	4.08	135	4.2	122	4.52		
60′	219	3.26	195	3.5	183	3.67	167	3.88	149	4.16	134	4.44		
65′	241	3.2	216	3.4	204	3.56	185	3.80	166	4.07				
70′	263	3.1	237	3.35	224	3.48	202	3.76	181	4.01				
75′	287	3.07	265	3.26	242	3.44	221	3.67						
80′	311	3.02	288	3.2	265	3.39	238	3.63						
85′	336	2.97	311	3.1	283	3.34								
90′	362	2.92	335	3.07	302	3.30								

almost 32 million gallons per year.

The 1945 Helphenstine report, as it is called, discloses that approximately 259 million gallons of creosote, creosote-coal tar and creosote petroleum mixtures were used. Of this, 64 million gallons were creosote—petroleum mixtures, the creosote portion being 32 million, indicating that it probably was used largely in 50-50 mixtures. Creosote petroleum mixtures accounted for 25% of the total used in 1945, as compared with 23% in 1939, and 26% in 1940, years during which imports were close to 30 million gallons. This indicates that the short supply and low imports did not materially alter the pattern of usage between types of preservative.

The 1945 records show that 41% of the cross ties, 31% of the switch ties, 9.1% of the piling, 19.3% of construction timbers and only 2.2% of the poles were treated with creosote-petroleum mixture preservatives. Total poles receiving preservative treatment amounted to 4.2 million. In the case of each product, the bulk of the remainder was treated with straight creosote. In 1940, the proportion of poles receiving the mixture treatment was even less, which indicates that pole users have not favored the treatment and have only reluctantly accepted it under the stress of short creosote supplies.

The high percentage of railroad ties treated with creosote-petroleum mixtures is the result of mechanical wear's being the first limiting factor, and the belief that petroleum reduces brooming and cuts down tie plate wear.

It is not likely that good estimates of life to obsolescence would, in the case of poles, permit designing to say a 20-year average life against decay instead of the maximum possible. Considering the hazard involved and the increasing desirability of reworking used poles, it would seem that utilities will always be interested in maximum life.

As substitutes in times of short creosote supply, most all evidence to date indicates that creosote petroleum mixtures *fortified* with pentachlorophenol are initially as effective as straight creosote. The penta mixes do not have the benefit of as long histories, so final evaluation must await collection of more data.

Several encouraging service records can, however, be cited to substantiate the early favorable experience with penta. One ten-year history, concerning an experimental installation on the Harrison Experimental Forest in Mississippi, was reported this year by J. O. Blew of the Forest Products Laboratory. For the treatments that are being considered the results were:

1. Straight coal tar creosote; 100% remained serviceable.
2. A 50-50 creosote crankcase oil mixture; 100% serviceable.
3. A 10% creosote, 90% crankcase oil mixture; 42.4% remained serviceable. This is indicative of what may be expected when going too far in the direction of creosote dilution.
4. A 4.82% penta (by weight) in used crankcase-oil solution; 100% serviceable.
5. A 3.02% penta in crankcase-oil solution; 98% serviceable.

Reports of the American Wood Preservers Assn. contain a number of service records on 5-year-old installations, largely posts, all of which indicate that the 5% penta solution in proper retention, is as satisfactory as creosote. Also the Southern California Edison Co. has some 5-year-old pentachlorophenol treated poles. Recent inspections revealed that so far there are no grounds for criticizing the decay and termite resistance of this treatment.

Although penta appears from the evidence at hand to be a very satisfactory fortifier, it too has been in short supply, and its cost is not far from straight creosote. At least one supplier is, however, establishing a blending plant on the Pacific Coast, his intention being to supply penta dissolved in a satisfactory oil. Prices were reported to be only one or two cents per gallon under creosote. Establishment of this plan suggests that its owners expect penta to be available in quantity.

Another fortifying agent, copper napthenate, has been used in recent years with some success. As used in 50-50 cresote-petroleum mixtures the metallic copper runs from 0.5% to 0.75% by weight of the petroleum portion. Recent tests by the Forest Products Laboratory indicate that retentions should be at least 0.25 lb. metallic copper to the cubic foot of wood, in order to be of comparable toxicity to creosote and 5% penta solutions. Only very limited laboratory and service test data are available on copper napthenate. Four- and five-year-old histories on two experimental test-stake installations are of record. These were pressure treatments and for concentrations within the normal range, all test pieces were good. One group treated with the low concentration of 0.11% copper metal showed only 60% remaining good at the five-year mark. No evidence of health hazards have been reported as the result of ordinary handling of wood treated with the material in its large use during the late war. The treating solutions are not significantly corrosive to iron or steel and present experience has developed nothing that indicates any reduction in strength of the wood.

A problem in supplying fortified mixture treatments is to find petroleum oils that will be compatible with creosote. That is an oil that will not sludge, will have high solvency for the fortifying agent, will not form water emulsions that are difficult to dehydrate and will have a specific gravity appreciably different from that of water.

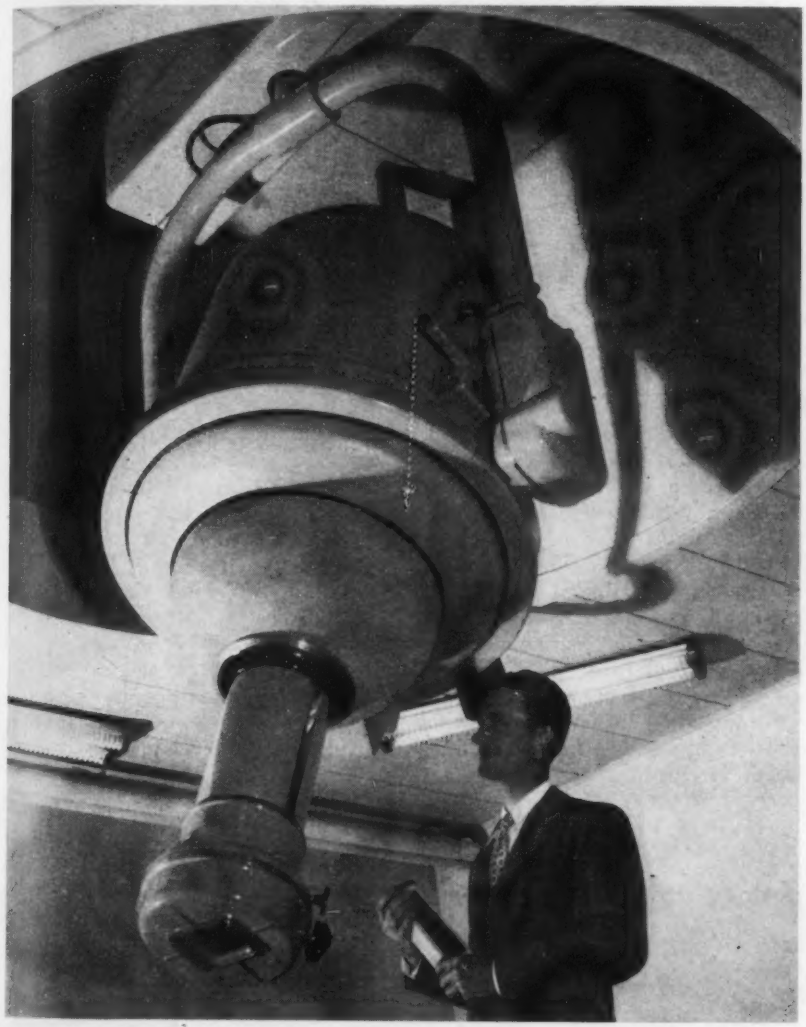
The use of unfortified creosote-petroleum mixtures as a means of regulating the concentrations of creosote and to secure penetrations so that the sapwood of all size poles will have equivalent retentions of the toxic elements seems to be feasible.

The question of what quantity should be considered as an adequate concentration when arrived at by this means of using petroleum oil as a carrier for creosote can be approached from at least two viewpoints. One is that of the Pacific Tel. & Tel. Co. engineers. They made the reasonable assumption that a concentration equivalent to that found in a Class 5, 30-ft. Southern yellow pine, treated with an 8-lb. empty cell process, should be adequate because of the past satisfaction with that treatment. The sapwood of a treated pole can be considered as a blotter-like reservoir, holding in storage the toxic substance which repels the decay-forming organisms. As time goes by, the protective layer loses its effectiveness, apparently through volitalization of the toxic compounds and change in composition. This loss is evident in service records, which show that a time is reached when the protected materials commence to fail all within a short period. It is true that this may not occur until a very satisfactory service life has been reached, but the fact that it does happen indicates that the period of effectiveness may be a function of the quantity of preservative stored in the sapwood. If this were so, it would not be advisable to reduce the amount to be stored in the sapwood of Douglas fir below that amount in a typical Class 5, 30-ft. Southern pine. Hence a higher unit concentration to compensate for the thinner fir sapwood is indicated.

Some evidence supporting the other viewpoint, namely that the unit concentration in the sapwoods can be the same, comes from the results of tests on some 25-year-old timbers which were at the time still well preserved. The extracted oil proved to be anthracene, one of the least volatile constituents of creosotes. Assuming that the anthracene was the material protecting the wood and that it was not going to lose its effectiveness, then it would be proper to assume that a similar residual of the same unit concentration

would remain as an effective preservative in Douglas fir sapwood.

Another factor to be considered in using the petroleum mixtures is the so-called blanketing effect. That is, in diluting creosote, it has been observed that the toxicity may be reduced below what would be expected from diluting only. Details on this effect are presented in a paper entitled, "Creosotes, Their Toxicity, Permanence and Permanence of Toxicity" by W. H. Snell and L. B. Shipley in the 1936 *Proceedings* of the American Wood Preservers Assn. These tests showed that whereas 1 gram of the original creosote was required to kill the test fungus, 3 grams of a mixture of equal parts by weight of the original creosote and petroleum were required, or 50% more creosote. Service records do not provide material that would permit further examination of this effect.



Last word in X-ray equipment for medical use is this million-volt unit to be installed in Sutter Hospital, Sacramento, by a group of four physicians. This will make the most modern equipment for radiation therapy available on the West Coast for the first time. G-E X-Ray Corp., builders of the machine, previously furnished a similar unit to the Army's Walter Reed Hospital, Washington, D. C. Advantage of the high voltage in radiation therapy is that high internal penetrations can be achieved with great reduction in accompanying undesirable effects on the skin. Remarkable feature of this unit is that tube and transformer are contained in the single flexible housing. Just prior to the war, equipment of such rating would have filled a three-story building. Only external component is an m-g set for furnishing 180-cycle power. All tube-head movement is by motor drives, controlled by a hand-held switch array. Million-volt X-ray has found considerable industrial use, West Coast installations including one at Columbia Steel, Pittsburg, Calif., and one at General Metals Foundry, Oakland. One designed primarily for non-therapeutic use is situated at California Institute of Technology, Pasadena. Machines of similar voltage for medical purposes, but of less compact design, are installed at University of California and Stanford Lane hospitals in San Francisco, and at Swedish Hospital, Seattle. Supervoltage X-ray is used extensively for cancer treatment. X-radiation of the G-E machine is equivalent to that from 8½ lb. of radium, which would be worth about $50,000,000

Information is available on a Montana installation of 5,600 25-ft. Douglas fir poles which were given a mixture treatment, the creosote retention being quite close to the 5 lb. that had been computed as being desirable for 25-ft. poles on the basis of Southern pine experience. These poles were treated to 7-lb. retention with a 75% creosote, 25% petroleum mixture. This represents a 5.4 lb. creosote retention. At the time of inspection, approximately 12 years after setting, none had been removed due to decay in a section of 726 poles. This tends to establish the effectiveness of the 5-lb. retention, although at twelve years it is too early to say for sure.

First-cost savings of as much as 90c and $1.10 per pole in the popular Class 5, 35's and 40's have been indicated through use of a 50-50 mixture. If service life equal to that from straight creosote treatments can be anticipated these costs are certainly attractive. But if it should develop that for any reason the average life proves to be only a few years shorter, the annual cost may actually be greater. As an illustration, assume that a 40-ft., pressure-treated Douglas fir costs $75 in place. The annual cost, with interest at 5% and depreciation on a sinking fund basis, for a 20-year life is $6, for a 25-year life it is $5.32. At equal annual cost it would be possible to invest $9.50 more initially, in order to get a 25-year life. Annual costs for 35 and 40 years are $4.57 and $4.35 respectively. At the same annual cost of $4.57 it would be possible to add $3.60 to the first cost in order to get 40 years average life.

In each comparison, the amount available to guarantee a five-year extension is considerably more than the initial savings through use of a mixture treatment. An accurate estimate of eventual savings thus depends on an accurate prediction of pole life. Service records on mixture-treated poles do not as yet make possible such accuracy.

It seems reasonable to conclude that petroleum creosote mixtures fortified with pentachlorophenol are acceptable substitutes for straight creosote, and that additional service records are required in order to establish proper creosote concentrations and life expectancy for unfortified mixtures.

GOOD BUSINESS IN YOUR OWN HOME TOWN

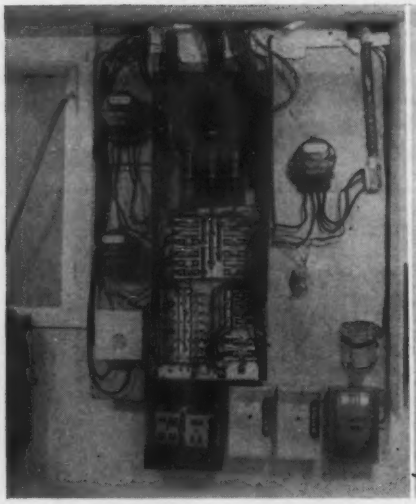


Fig. 1

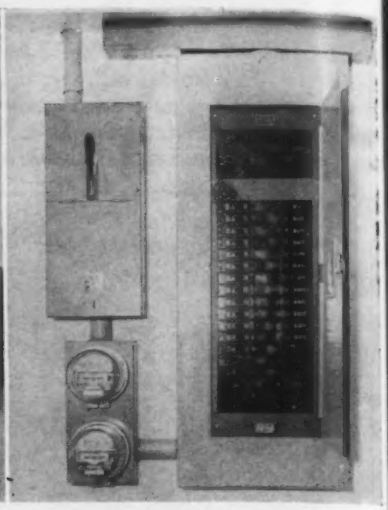


Fig. 2

An elert eye, and a little intelligent selling, will enable the small contractor to pick up a lot of rewiring business and at the same time perform a service to his community in cleaning up hazardous situations. This principle is stated by L. M. Risley, who operates the Skagit Electric Co., Mount Vernon, Wash., and he offers a couple of convincing demonstrations to prove his point.

The first example appears in Fig. 1. This installation, in a small hospital, was so bad that an overheated fuse started a fire which traveled up the inside of the metal inclosure to the switch and set fire to the room. Luckily, the fire was put out before it got into the room and thence into the building—a result which could easily have been tragic.

This original installation had a plywood switchboard, dotted with meters and mounting a single enclosure into which was stuffed the main switch and a hodge podge of fuses—the picture is more eloquent than words. Skagit Electric installed a new main switch and meters in metal inclosures, with an adjacent circuit-breaker panel, all of which appear in Fig. 2. The job leaves room for future additions.

Fig. 3 shows about as horrible an example as can be imagined. Skagit Electric ran into this one—in a small hotel—when they went in to make an even further addition. A little customer education led to the results in Fig. 4.

Hundreds of conditions like these can be turned up, conditions that have developed through neglect or ignorance. Each provides the small contractor with an opportunity for good business and the chance to perform a real community service.

Fig. 3

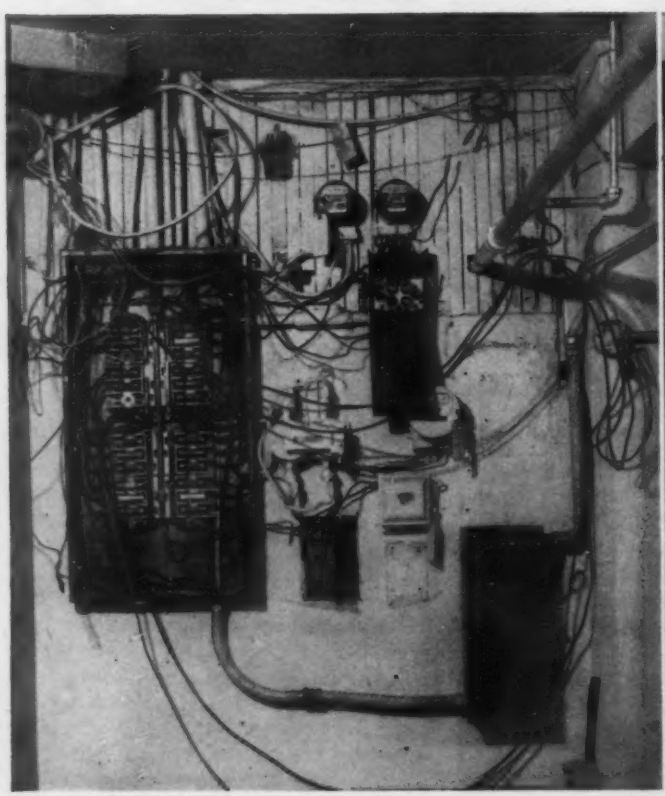
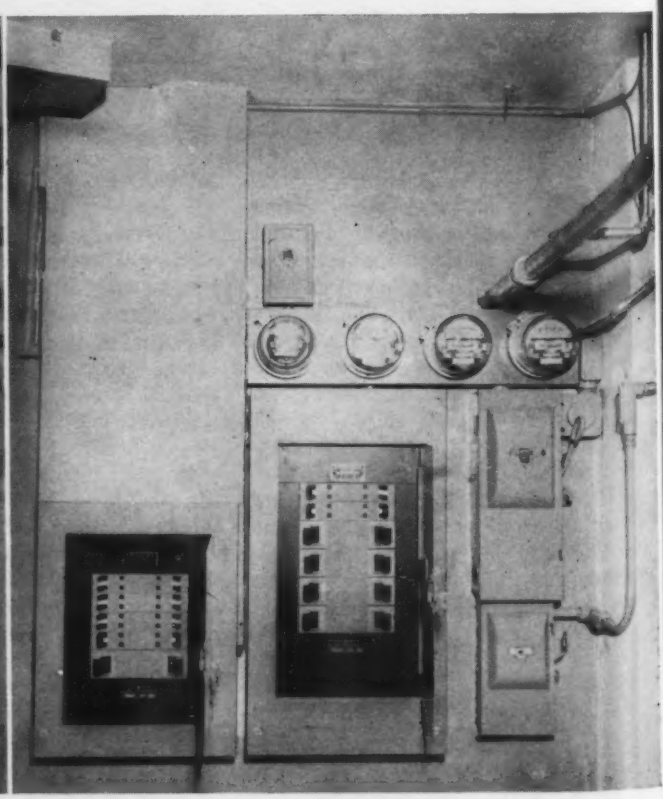


Fig. 4



How About These Underwriters'?

Answers to the most frequent questions as to what the organization is, and what it does—Last of two parts

Howard Dodge

What Is the Cost of Examination and Test With a View to Listing?

The charges to a manufacturer for the examination and test of a product are billed on a time and material basis and thus a complete description of the product involved must be obtained before the manufacturer may obtain a "Cost Limit" from the Laboratories. Such a "Cost Limit" tells the manufacturer in effect that the final changes will not be in excess of the specified amount for one set of tests and examination—this figure is in no sense a cost estimate, for the work is billed on a time and material basis as previously stated.

In many instances where a manufacturer desires to submit an extensive line of devices, costs may be greatly reduced if the manufacturer submits complete information concerning the entire line before the initial submittal. In this way it is often possible to extend listing to several products based upon a detailed examination and test of samples judged to be typical.

How Do You Determine If a Device Is Listed?

A copy of the booklet entitled, "List of Inspected Electrical Equipment" should first be obtained—there is no charge for this publication and it is generally available in any of the Laboratories' offices. After you have received this booklet the following steps should be taken: (1) Determine the classification under which you would expect the device to be listed. (2) Refer to the index to find the page on which the listing of the classification begins. (3) Note that immediately preceding the first manufacturer's name under the classification there will be printed the words "Label Service," "Reexamination Service" or "Special Service." (4) If the words "Label Service" appear the device in question is covered by the Laboratories service *only when it bears the label illustrated or described* for the classification. (5) If the words "Reexamination Service" or "Special Service" appear examine the device for *markings* thereon of manufacturer's name, tradename or trade-mark, also of catalog designation, type letter, or other identification. Compare the marking on the device with the information given at the end of the manufacturers' listing after the word "Marking." The device is listed if it is marked as there indicated. When the "Marking" as given at the end of the manufacturer's listing includes catalog, type, model or similar designation then the device *must be marked* with that designation. (6) If, in the absence of the manufacturer's name, a tradename or trade-mark appears on the device then turn to the "List of Markings" in the back of the List of Inspected Electrical Equipment to determine the name of the manufacturer for which the tradename or trade-mark is recognized and proceed as above.

How Long Does It Take to Secure a Listing?

This depends mainly upon two factors, namely, the amount of work previously scheduled and the scope of the investigation.

Under normal conditions most investigations are completed within three weeks after a manufacturer submits a sample and files a regular application. Because of the unusually large amount of work received at the San Francisco office since the end of the war three-week "promise dates" have not been possible. Quite recently these "promise dates" have been decreased from six to five weeks and by the middle of this year it is anticipated that three-week "promise dates" will be given.

In some cases it is not possible to reduce the time of investigation because the specified tests themselves may take several weeks to complete. For example, the investigation of a new compound for Type RW wire takes several months because insulation resistance tests have to be made over a long period of time. Usually, however, the actual test time is considerably less. For example, all the tests conducted on the ordinary type of table stove could be completed in three or four days. In some cases, no tests are required, and the necessary examination of the product may be conducted at the factory. In such instances it is often possible to inaugurate label service and listing within a day or two after a manufacturer has made formal application and submitted samples for examination.

Is There a Plan Whereby Manufacturers May Obtain a Preliminary Report from Underwriters' Laboratories Before Their Product Is Actually Ready to Market?

The submittal of a product in model stage has always been encouraged because it enables the manufacturer to obtain a report before heavy die costs are incurred. Although actual listing may not be promulgated on the basis of the submittal of a model, such submittal does pave the way for the submittal of a commercial sample at a later date. If the commercial sample is identical with the previously accepted model the Laboratories work is greatly facilitated and thus the manufacturer receives better service than would otherwise have been possible.

May a Product Be Labeled Outside a Manufacturer's Factory?

Ordinarily, inspections are made in a manufacturer's factory but if some unsual condition brings about the necessity for conducting a field inspection this may be arranged, provided the manufacturer requests such an inspection and, provided further, such an inspection is agreeable to the local authorities having jurisdiction.

Under no conditions is the manufacturer permitted to send labels through the mail for attachment to products outside his factory. In other words, the only way a product may be labeled outside a manufacturer's factory is to have a field inspection conducted by a representative of Underwriters' Laboratories, Inc. If the product in question is found to be acceptable the use of a label will be authorized and the local inspection authorities notified accordingly.

Will Underwriters' Laboratories Inform the Local Inspection Authorities When a Device Has Been Submitted for Examination and Test Even Though the Device Is Not Actually Listed?

Upon receipt of a written request from any manufacturer submitting a product for examination and test the Laboratories will gladly inform the local authorities concerning the submittal involved. It should be emphasized that such information may be given out only after the manufacturer has filed an actual request in a specified manner.

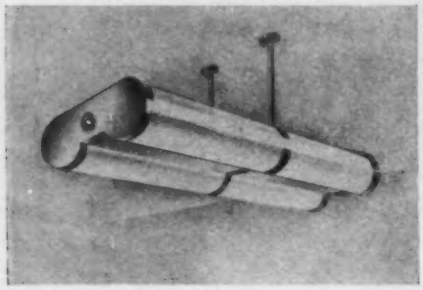
Does Underwriters' Laboratories Appreciate Constructive Criticism?

While every attempt is made to have actual field conditions simulated in the Laboratory there is no substitute for actual field experience and thus constructive criticism is always welcomed. Valuable suggestions are received regularly from local inspection authorities. During the time that Harold L. Gerber was chief electrical inspector for the city and county of San Francisco, for example, he made many suggestions, and a large percentage were adopted.

For many years Underwriters' Laboratories, Inc. has obtained the opinions of men with wide field experience before promulgating the listing of many products, particularly those involving some new principle. This has been accomplished by submitting the findings of the staff to what is termed an Electrical Council, final action and listing of the appliance or material being dependent upon endorsement of the recommendation of the staff by the council. The Electrical Council membership is made up largely from municipal, state and insurance inspection groups. Council membership is limited to those having no interest in actual electrical manufacturing.

Prize Winners

PG and E men walked off with two prizes in Sylvania Electric's third annual fluorescent fixture design competition recently. Warren W. Weiss, with PG and E in San Francisco, won fourth prize of $100 in the national competition for his design of a translucent reflector for two 100-watt lamps. Rotating side shields permit either indirect illumination, or direct, as for lighting blackboards.



John C. Epperson, with the company at Stockton, was one of 18 winners of $50 meritorious awards. The contest was limited to engineers of public and private utilities.

Farm Book

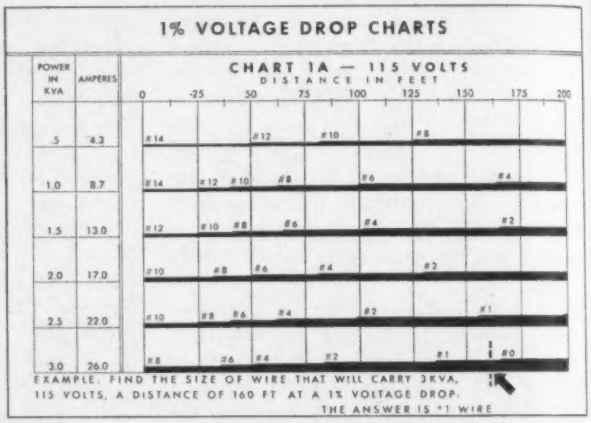
"This book is directed to farm dealers, jobber salesmen and contractors who wire farms, and to farmers."—Foreword to *Farm Wiring*.

Published by Westinghouse, and selling for 25c, *Farm Wiring* lives up to its title with remarkably comprehensive treatment of the electrical information needed by those addressed in the foreword. It looks like a magazine, runs to 43 pages.

It conforms to the recommendations of the *Handbook of Farmstead Wiring Design*, while adding the working detail, basic information and equipment data, including pictures, necessary to carrying out the outline set forth.

Among the data are a series of voltage-drop charts, one of which appears in half size at right. For easy reading, the thickness of the horizontal bars is made proportional to wire diameter.

Sample of the easy reading voltage drop charts contained in "Handbook of Farmstead Wiring Design." The horizontal bars in the diagram are proportional to various wire sizes. Handbook contains comprehensive data about the wiring of farm buildings


1% VOLTAGE DROP CHARTS
CHART 1A — 115 VOLTS
DISTANCE IN FEET
POWER IN KVA
AMPERES
0 25 50 75 100 125 150 175 200
.5 4.3 #14 #12 #10 #8
1.0 8.7 #14 #12 #10 #8 #6 #4
1.5 13.0 #12 #10 #8 #6 #4 #2
2.0 17.0 #10 #8 #6 #4 #2
2.5 22.0 #10 #8 #6 #4 #2 #1
3.0 26.0 #8 #6 #4 #2 #1 #0
EXAMPLE: FIND THE SIZE OF WIRE THAT WILL CARRY 3KVA, 115 VOLTS, A DISTANCE OF 160 FT AT A 1% VOLTAGE DROP.
THE ANSWER IS #1 WIRE

Part of the new lighting fixture display rooms of Gilbert Brothers Inc., Portland. Floor space of 20,000 sq. ft. and 650 outlets permits showing a great variety of fixtures. J. R. Grossman manages the lighting fixture division. Established in Portland in 1924, the firm now has branches in Salem, Eugene, Seattle and Yakima

BRIGHT STREETS

Street relighting has been forced to a slow pace by equipment shortages, but a few towns are getting new lights in limited quantities, and their installations show what "main" streets are going to look like on evenings a few years hence.

Arcadia, Calif., served by Southern California Edison Co., is one of the forerunners. In 1917 Arcadia installed 2,500-lumen lamps on 10-ft. ornamental standards, with results as indicated in the upper picture.

Now Arcadia has replaced the old installation along Huntington Drive and part of First St.—the latter being the subject of the upper photo. The same section of street after modernization appears in the picture at bottom.

The daytime view of Huntington Drive, at center, shows the nature of the installation.

Fifty-nine of the old standards were removed and 93 new ones installed. The new ones consist of senior enclosed pendant reflectors, mounted on 4-ft. arms at a height of 25 ft., 3 in.

The streets are 75 ft. wide. Standards are situated opposite one another at normal spacings of 100 ft. The new lamps are 6,000 lumen.

Total cost of the installation was $36,294, less an estimated $7,500 salvage value for the 10-ft. standards, which will be used for replacements in residential areas.

BRIGHT IDEA

Vest pocket foot-candle selectors are being sold at a dime each at G-E Lamp Dept. district sales offices. The selector is a neat appearing little device having a traveling arrow which can be moved along a foot-candle scale which resembles a light-meter scale. At a given setting, color signals appear in windows opposite those tasks for which the given illumination is recomended. The device is stamped out of heavily glossed paper, is 2¼ in. square. It comes in an envelope which can be imprinted at slight cost with any message desired by the purchaser.

BRIGHT FIELD

For $126,000 Los Angeles Coliseum is getting 100 ft.-candles on the playing field by means of six towers, each carrying 72 1,500-watt Crouse-Hinds floods. Design is by Bennett & Bennett, Pasadena architects; Victory Engineering & Electrical Co. is the electrical contractor.

ELECTRICAL WEST
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

Lesson in Semantics

IN spreading the gospel of the American way of life, we have acquired a habit of using a series of generic terms without considering whether or not readers or listeners understand their meanings. Seriously some of the most vocal and vociferous defenders would be hard put to give clear and concise definitions of such terms as "free enterprise," "individual initiative," "industrial democracy," and "free competition." The professional wrecking crews that are working hard and enthusiastically to create false impressions of American industry, American democracy and American ideals take particular delight in twisting the meaning of such terms into sinister and deceptive channels. For the sake of clarity and understanding it would be well if the definitions of these terms could be as simply stated as the meaning ascribed to free enterprise by a homely philosopher whom we know. He says that free enterprise means "the right to prosper in direct proportion to how much you choose to sweat." Anyone can understand that.

Old Policy—New Twist

IT can be truthfully said that no power company ever lost load, revenue, or goodwill by working to reduce the cost of electrical applications to its customers. The record of the light and power utilities is one of declining rates for every type of service. This policy has paid off in ever-expanding uses. It is the fundamental principle on which the programs of commercial and industrial sales departments are based.

In the light of this principle it should be within the purview of the power company sales department to protect the customer against electrical applications of doubtful benefits and potentially exorbitant cost. In such a category is a proposition for so-called "frost protection" being offered to Western farmers, particularly in the citrus regions of California. For a rental of $200 per acre on a ten-year basis, 250-watt infrared carbon lamps would be hung on 40-ft. centers over a field or orchard. Load density thus would be 10 kw. per acre. In addition to the rental charge the farmer would be expected to pay energy charges for approximately 400-500 burning hours per year. A little mental arithmetic indicates that the ten-year cost for such an installation would approximate the value of a full-bearing citrus grove, and be well in excess of the value of land devoted to other crops.

Under the circumstances a warning as to the doubtful economics of this kind of an application would appear to be an obligation that the utilities cannot ignore.

More Human Relations

ALONG with the nostalgia in the hearts of the oldtimers there was a real thrill for the newcomers in the homecoming convention of the Pacific Coast Electrical Association held at the Mission Inn at Riverside last month. It was the thirtieth anniversary of the founding of the association and the eight hundred odd people in attendance not only could look back with pride in the electrical industry's achievements but could look ahead with assurance of the industry's ability to meet whatever challenges the future might present.

Whereas thirty years ago only a place or two on the program was devoted to the comparatively new subject of public relations, almost the entire program this year was devoted to the broader and more all-inclusive subject of human relations. How to work congenially with each other, how to satisfy and please our customers and how to live with the public are today's major problems. President M. G. Sanders keynoted the program in these words:

"The electrical industry, which is made possible *by people* who have invested their savings in our businesses, is predicated upon service *to people* by the dignified occupation *of people*. In a world of confusion, contradictory ideologies, misunderstandings and deceit, we should be spurred by the realization that our industry gives us the background to become the leaders in a new age of human understanding. You newcomers may enthuse over the fact that our industry is as young today as it was thirty years ago, offering even broader horizons to challenge your initiative and ability."

If the convention did nothing else, it demonstrated that the industry has benefited from the experience of its yesterdays, is competent

EDITORIAL VIEWS

to handle the complexities of its todays and is capable of accepting the challenges of its tomorrows.

Between the Horns

"A NICE dilemma, we have here" sang the Gilbert and Sullivan chorus in *Trial by Jury*. But that dilemma is as nothing to the one this industry finds itself in over range installation. The horns of this dilemma are LP gas on one side and skyrocketed wiring costs (caused by high labor and increased material costs) on the other. Whichever way the industry turns it gets stuck.

The only place that range selling can proceed reasonably is where the utility frankly capitalizes or subsidizes part or all of the cost of wiring in the range. But this angers other utilities whose policies are opposed to range subsidies and who think that it is high time people pay for their own wiring. There are arguments on both sides of this controversy that make sense to the respective contestants. But while the argument goes on, LP spirits away the business on a tank of gas.

For the sake of getting this thing settled and out of the way as a sales obstacle that diverts so much effort that might better be spent in selling, ELECTRICAL WEST invites its dealer, distributor and utility readers to speak their minds on the subject. Let us have a forum on range wiring installation, that we may air the subject, clarify it, and, let it be hoped, find a compromise solution on which all can then go to work.

The Labor Law

NOW if organized labor will stop stamping its feet like a spoiled child, quit its blind yelling and calm down a little, it could find that the Taft-Hartley act is not so bad for it as its prejudiced leaders have led it to believe. The pendulum had been swung so far over to the side of labor by the Wagner act that it was grossly unfair to both owners of businesses and to the public. The Taft-Hartley act, even if it had to overcorrect in some details, sought only to bring the scales of Justice once more into some semblance of equality.

What the labor legislation has done is to put the unions back into a status of having to show enterprise and to deliver quality and benefit if they want to retain members or to earn new ones. It takes away the monopoly which the Wagner act imposed and which made slaves of working people to a new set of masters, the union leaders. Monopoly has never been tolerated in this country and let it never be tolerated. When utilities got into a monopoly status, the public demanded they be rigidly regulated. When business grew into monopolies, the public reacted with laws to break them up. Now that labor unionism has blossomed into monopoly and holds the right to work and earn a livelihood in its power to grant or refuse, the public has had to call a halt to this new monopoly through its elected Congress. If labor is wise, it will settle down to making its unions so beneficial that its members will *want* to belong without coercion or edict.

BOTH the Socialists and Communists dwell upon the shortcomings of the free enterprise system and, by implication at least, take the position that these shortcomings would not be present under their own system. In short, they preach, directly or indirectly, a gospel of perfection. This is one of their great strengths because, although philosophers know that there is no greater illusion than that any system of human beings can be perfect, it is nevertheless a great rallying cry for all those who are in any way discontented with their present lot. Not Jesus Christ, nor any of the world's great religious leaders, has preached moral perfection on this earth. They knew human beings, and that was reserved for Heaven. The turgid pages of history have amply proven the wisdom of this doctrine. Yet today, despite the proven moral frailty of man, we have many collectivists preaching, and many people believing, that they can have an economic and political heaven on earth. The danger is that, should this preaching triumph, we may, as a result, all be plunged into an economic and political Hell."—A. E. Grauer, president, British Columbia Electric Railway Company, Ltd.

1917—After 30 Years PCEA Discovers

IN the reminiscent atmosphere of the famous old Mission Inn at Riverside the Pacific Coast Electrical Assn. appropriately held its 30th anniversary convention. Amid a lush profusion of nostalgic souvenirs of the early mission days of California, its members found memories of the first convention of the association, held there April 19-21, 1917.

And in this religious shrine of mission and church accoutrements the association seemed to renew its vows of friendship, tolerance and its dedication of service to the public which it had taken there in 1917. John Britton, as chairman of the public policy committee, had enunciated those principles when the Pacific Coast Division of the National Electric Light Assn. was founded.

Had tall, earnest, yet good-humored Milton G. Sanders, president of PCEA, as well as vice-president of Central Arizona Light & Power Co., Phoenix, worn the frock of a friar, his presidential address might well have been a fine sermon to the youth of the industry on its opportunities and responsibilities. In like spirit H. H. "Kelly" Courtright of Fresno, in accepting the presidency at the close of this Riverside convention of June 4-6, 1947, reconsecrated himself and the association to the creed of friendship, helpfulness and working together that had come into expression with the first convention.

Such are the contrasts of life, though, that amid the oldest of sentiments and aspirations attention also had to be paid to the most modern of questions of a scientific age—atomic power. The industry's success in handling tremendous quantities and pressures of electric power in the 30 years since its inception leads to hope that its men will be able to handle atomic power more easily than the world has been able to handle explosive human nature, some of whose problems the association also searched into.

It was a huge convention—805 registered during the three days. They had to be housed as far away as Arrowhead Lodge and southern Californians commuted to the convention each day.

It was a good convention. Every one of its programs and sessions was profitable, either in ideas, ideals or methods. It was a happy convention, for it brought back together men and women of the industry from all parts of California, Arizona, Nevada and Hawaii for a reunion. The old-fashioned flavor of the Inn, the memories of men and of projects of the past gave the convention mellowness.

The industry wasn't under attack this time. It had proved its sincerity despite its critics. It had weathered the greatest stresses ever put upon it, those of meeting all the demands two wars had made upon the industry. It could look back over its 30 years with pride of real achievement. It could look ahead with assurance that it could meet whatever challenges are thrown before it in the years to come.

Just as the original convention had expanded upon the formula of the power company association, NELA, to bring in its friends and associates in the business, contractors, dealers, wholesalers, manufacturers and inspectors, all of these were well represented at Riverside this time.

The convention opened June 4 with a general session at the Riverside theater, borrowed for such meetings because no other auditorium provided enough space for such a huge turnout. After introduction by Vice-President M. G. Sues, Sues, Young & Brown Co., President Sanders delivered the presidential message published in last month's ELECTRICAL WEST. With a casualness and friendliness that made it seem extemporaneous, he made this presidential address something unique to recall, alongside the unforgettable one made by A. M. Frost in 1931.

When the applause stopped, a commotion at the rear of the house brought forth an indignant old man with long whiskers, dressed in the pinched styles of 1917. He claimed to be a member, thought it was still 1917 when Russell Ballard was president. This R. P. Van Winkle (played by William McGuire of Graybar, Los Angeles) had been bibulous and playful, had passed out cold after being put among the waxworks tableau at the Mission Inn, and had just come to consciousness now. On learning that it was 1947 instead of 1917, he asked

there's Work Ahead for Everyone—1947

to be told what had been going on during these 30 years. Don C. McNamara of Telefilm Inc., Los Angeles, as narrator, was asked to review the electrical progress of the period for him, illustrating it with contrasting pictures of old and new (from a script prepared by William A. Cyr, ELECTRICAL WEST).

On learning that such problems ot 1917 as range wiring cost had not only *not* been solved but had grown worse, Van Winkle went back to the waxworks to sleep until the industry does something about them.

With this opening, providing the link between 1917 and 1947, the convention turned its attention to today and tomorrow, yesterday having given a good account of itself. The three sections of the association went into separate session in parallel to consider matters concerning their respective phases of the industry. Reports of these sessions, as well as of the general sessions and the featured luncheon speakers, follow.

Convention arrangements dovetailed so smoothly that the committees in charge of various parts, directed by J. A. Long, Southern California Edison Co., as convention chairman, and the stage management handled by Leon S. Heseman, California Electric Power Co., were complimented highly. Chairmen of the various committees were: attendance, George C. Tenney; banquet, G. F. Maughmer; cocktail party, Earl S. Condon; golf, W. D. Howze; hostesses, Mrs. Albert G. Cage; hotel, L. G. Peck; ladies entertainment, W. S. Fleming; program, H. H. Fogwell; publicity, A. X. Schilling; reception, Hance H. Cleland; registration, C. C. Potts; transportation, A. L. Laws; ushers, H. S. Warren.

The banquet, held in the basement of the civic auditorium, was followed by appropriate Spanish entertainment and then a dance.

MOST of the business of the association is done during the year. Thus only a minimum, required to fulfill its corporation requirements, is conducted at the convention. This includes election of officers, the reports of managing director and treasurer, the induction of the new president.

Usually Treasurer Norman Sutherland, Pacific Gas and Electric Co., injects quips of humor among the facts and figures of the financial report. This had to be done by proxy this year, and he was missed.

Victor Hartley, managing director, gave a brief review of the business the association had done for the year, emphasizing its function as the coordinator for the industry. Membership, he reported, has grown to 203 companies and 2,545 individuals, not counting those recruited during the convention. It represents a 10% gain over last year.

The code and ordinance committee has prepared a revised 1947 edition of its uniform electrical code, checked it with city attorneys of the League of California Cities. The unsafe electrical appliance ordinance has been adopted by three more cities, bringing the total to 90 and one county. Adequate wiring promotion has been carried on continuously to certify homes meeting the proper requirements.

Continuous work has been carried on by the technical subcommittee of the highway lighting committee in cooperation with the California Highway Commission engineers. The liquid petroleum competition committee has initiated surveys to determine how deeply this fuel has penetrated.

First preview of the industry information committee's program for the year was presented at the Thursday morning convention session. This program is to be taken to the membership at a series of district meetings this fall and next spring.

Hartley also reported joint conferences with similar groups in the gas association on subjects of mutual interest, such as accounting, auditing, transportation, customer relations, credit and collections and purchasing and stores.

New committees have been created. An electrical living committee coordinates five subcommittees on home lighting, electric kitchens, home laundry, home economists and adequate wiring. A communications committee coordinates allocation of frequencies for two-way radio communication. A

"R. P. Van Winkle" (Bill McGuire)

personnel committee, with representatives of the four major branches of the industry, studies personnel methods and seeks improved employer-employee relationships. The president's advisory committee has also been set up to coordinate the association's programs and prevent duplication of effort. *How Your PCEA Operates*, a booklet, was prepared by this committee for each member.

"It is not the purpose of the PCEA," said Hartley, "to undertake programs which are properly an activity of our individual company members, nor was it ever intended that we should police the industry, or that we should attempt to set up any standardized procedures. It is important, however, in any industry as large as this, with so many ramifications, that the individual programs be coordinated so that the industry as a whole may continue to progress."

As President Sanders had opened the convention with a challenging thought of the opportunities ahead for the younger members of the industry, H. H. Courtright, president, Valley Electrical Supply Co., Fresno, and division manager, San Joaquin division, Pacific Gas and Electric Co., the newly elected president, closed the convention on a similar note.

The theme of the first convention, Courtright remembered, was that of cooperation between the various branches of the industry. Although NELA was a utility company association, the Pacific Coast division had invited manufacturers, wholesalers, contracters and dealers to become members too. Out of the first convention came the creating of the California Electrical Cooperative Campaign, on whose board sat two representatives from each branch of the industry.

The thought behind this, said Courtright, was the building of a spirit of friendship, and cooperation, of consideration for the other fellow, of giving better service to the public. Through good leadership the association had built such a spirit as was not to be found in any other region. It had built teamwork that had been able to meet all the demands made upon the industry by the tremendous growth of the West and even the extraordinary ones of war.

Just ahead, declared the ever optimistic and sales-minded Courtright, lie still greater opportunities. The population of the United States has increased by 10 million since 1940 and, of this, one quarter of the total increase has been in the territory served by the association. Moreover people are coming into the state of California alone at the rate of 20,000 a month. While this throws a great burden upon the electrical industry it also creates a fine opportunity. The officials of the utilities have been refinancing and making sounder the financial structure of their business. The engineers are planning increases in generating and distribution capacity. Manufacturers are making more equipment. Wholesalers, contractors and dealers are all expanding.

Courtright hoped that this next year would develop an industry-wide plan of selling. This would be directed toward selling the increased capacities the engineers will provide. It will sell electrical living to the homes, the farms, the business and the factories. But this plan, said "Kelly" the cooperator, would sell as well all the employees of all branches of the industry on the uses of electricity and on the spirit of cooperation, of teamwork, of helping the other fellow, of giving the public better service.

"If I was starting all over again, what industry would I choose to go into? I would choose the electrical, because of the wonderful opportunity it offers. If so, where would I select as the place to go into the business? In the West, because the growth will be out here."

Directors elected for a two-year term are: R. E. Arbogast, Newbery Electric Corp.; W. E. Cranston, Thermador Electrical Mfg. Co.; C. C. Ernst, California Electric Power; C. W. Goodwin Jr., G-E Supply; W. C. Mullendore, Southern California Edison; D. D. Smalley, PG and E; G. C. Tenney, McGraw-Hill Publishing Co.; F. A. Tracy, Sierra Pacific Power; R. R. Walbridge, Southern California Edison. Carry-over members of the board are I. W. Borda, Okonite Co.; Charles Grunsky, Coast Counties Gas & Electric; Harry L. Harper, Graybar; A. G. Jones, G-E; M. G. Sanders, Central Arizona Light & Power; E. D. Sherwin, San Diego Gas & Electric; M. G. Sues, Sues Young and Brown; W. G. Willson, Westinghouse; A. E. Wishon, PG and E.

Human Relations In Business

Harry Woodhead
Consolidated Vultee Aircraft

GOOD sound human relations in industry are desirable because they produce a relationship that is mutually satisfactory and beneficial to both the employer and the employees. They help the business or industrial concern earn fair returns that will support a fair wage for the workers, a fair salary for the manager and a fair return for the investors.

One of the end products, of course, of good sound human relations in industry is high employee morale. Equally important as an end product of sound human relations in industry should be high employer morale.

Good sound human relations in industry that achieve high employee morale at the cost of company solvency are of little value. Not only is bankruptcy very hard on employer morale, but it also destroys the base on which the employee morale is established—jobs themselves.

There is always the danger that we will, to coin a phrase, morale ourselves right out of business.

Neither in industry, in the government, in the church, in civic bodies, in social organizations, or, for that matter, in the home, are good sound human relations merely a matter of passing a law, issuing an edict, publishing a decree, or making a pronouncement.

Good sound human relations can no

Sanders Long

more be assured in industry by adopting legislation or posting a company bulletin than can good sound human relations in marital affairs be guaranteed by mere recital of wedding vows.

In either industry or the family, satisfactory and mutually beneficial relationships can only be achieved if both parties bring to the association a sincere desire to make them work.

Good sound human relationships in industry can only flourish in an atmosphere of good faith and confidence. Their establishment requires something of the sincerity and responsibility that was involved in old-fashioned courting when the young man and the young lady sat on a horsehair sofa in the parlor with a pair of stern and sober parents waiting expectantly in the next room.

Under those circumstances marriages were proposed and accepted, not in terms of light flirtations, but with the full understanding that the marriage was going to be "for better or worse, for richer or poorer, until death do us part." Human relations in industry should be established on the same basis of frank acknowledgment that both management and the workers have a direct interest in the prosperity or poverty of their own company.

One of the most serious stumbling blocks to sound human relationships in industry today is the growing tendency to try and deal with all labor problems in the mass.

I think it is time we tossed out this "mass" concept of working people, and started considering men and women at work as human beings with important differences as well as with many similarities. I believe it is time we started dealing with those who work in the shops and offices of our plants as people rather than as faceless, formless, anonymous members of this or that party or group.

People change neither their appearance nor their natures when they walk through our plant gates. They continue just as honest or as dishonest . . . just as competent or as incompetent . . . just as responsible or as irresponsible . . . just as pleasant or as irascible . . . during the eight hours they are on the job as the sixteen hours they are away from it.

The good citizen of the community . . . and the good member of the neighborhood . . . will be the good employee of the company . . . and the good fellow-worker of the department.

He will, that is, if he is left to his own devices. But unfortunately the

Woodhead

story of unionism in this country during recent years is not a saga of free and independent action by individuals. On the contrary. . . .

I said in my opening remarks a few moments ago that good human relations in industry could not be achieved by fiat or decree, but are the end product of mutual desire and effort between management and labor. I want to expand that statement now by saying that while they cannot be achieved by decree they can certainly be prevented.

Unwise laws that, by sanctioning and even encouraging industry-wide bargaining, impede and even discourage the composing of differences at the plant level are no aid to the establishment of sound human relations in industry.

Union rules that require the employees of a company with whom the workers have no grievance to join in strike called by the leaders of another group of workers for another company are no aid to the establishment of sound human relations in industry.

Nor are regulations that deny to the employer the right to discuss management-labor affairs with his own employees of any aid to the establishment of sound human relations in industry.

Sound and constructive human relations between management and labor are only possible through direct contact between a company and its employees. . . .

Human relations in industry, if they are to be sound and mutually beneficial, require, first, consideration of employees as individuals; second, elimination of all forms of paternalism; and, third, a strong management that is willing and able to take a fair, reasonable and constructive position in labor relations and maintain it.

I have no sympathy with those weak, spineless employers who, under the guise of "human relations" deliberately sacrifice the rights and duties of management rather than face an issue which might cause trouble, even though that management is sure it is right. Such a management is simply kidding itself, or else practicing a form

Founders, who had attended the 1917 convention, included, front row: N. B. Hinson, R. M. Alvord, L. M. Klauber, C. A. Kelley, R. A. Hopkins, A. E. Holloway, B. T. Story; second row: P. G. Jones, J. S. Thompson, J. M. Morris, F. J. Airey, R. G. Boyles, G. H. P. Dellmann, C. D. LaMoree; third row: P. P. Pine, L. A. Nott, C. C. Bartlett, L. S. Heseman, R. H. Halpenny, W. P. L'Hommedieu, R. A. Murphy. Several others were seen but were not corralled

of self deceit, in pretending that its actions are guided by its desires to improve relations with its workers instead of admitting frankly that it is afraid to accept the consequences of taking honest action.

Appeasement did not ward off the last war. Appeasement will not prevent labor strife.

The formulae for preserving labor peace by building good human relations in industry is not complicated or beyond the understanding of any normally intelligent person.

You as management manage your own business. Retain the functions, rights, privileges, perogatives, authority and duties of management. Insist your employees retain the rights to which they are rightfully and legally entitled. You do business with your employees as you should do, giving and demanding the respect and confidence that should be expected of men of principle.

Remember that your employees have no more right to take over your functions than you have to take over theirs. You run your business. They run theirs. You treat them honestly and fairly, pay them as well as you possibly can, bargain collectively in good faith with the accredited union representatives on the subjects of wages, working conditions and hours as you should do. And that is that. Anything beyond that, no matter what you call it, is wrong.

Trying to stick your nose into your employees lives is dead wrong. If you will pay your employees adequate wages they can provide their own amusement, buy their own homes, educate their own children, and pay their own grocery and clothing bills. Such matters are definitely the private business of the employees.

Attempting to poke your nose into the private affairs of your employees is not human relations, it is wishy-washy, maudlin sentimentalism. It is paternalism.

Good sound, mutually beneficial human relations in industry grow out of the firmly held conviction that all parties to the association tend to their own business.

And a Preview

AIMED at informing and inspiring the rank and file of the industry, a program sponsored by the Industry Information Committee was previewed at the Thursday morning general session. Modified as reactions from the preview dictate, the program will be taken throughout the PCEA territory during the fall and winter if present plans mature.

Purpose of the three-part program was to demonstrate the achievements of and opportunities in the electrical industry, indicate the complexities confronting management today and point up the advantages of the American way of life. Two speakers and a motion picture effectively accomplished this purpose.

I - New Electrical Horizons

Using fascinating and spectacular demonstration equipment, Walter C. Smith, consulting engineer, told of the progress of electrical development, showed some of the current products of the industry's research laboratories and translated these into potential public benefits. His discourse on *New Electrical Horizons* was largely built around the wave spectrum.

Even though the present progress of the electrical industry has largely occurred within the lifetime of people in his audience and even though there are those who would conclude that no further progress is possible, Smith declared that the industry is only on the threshold of potential development and service. He then paraded an interesting series of recent laboratory developments to demonstrate the validity of this assertion.

New glass insulation material, he said, is making possible a reduction in the size and weight of many electrical devices thus permitting applications in many new fields. Silicones which start from a base of sand and end in either oils or artificial rubber have manifold possible applications in the electrical industry. War-developed plastic insulation materials are altering both equipment and application techniques. New alloy steels have made possible the development of new and powerful magnets, and he demonstrated the power of a small 1-lb. "Alnico" magnet by lifting 49 lb. of bricks. Latest application of this product, he said, was by a dentist who is placing four tiny magnets with poles opposed in dentures so that they are held constantly in place in the mouth by slight pressure. Nonmetallic magnets made from oxides are the latest laboratory product in this field with many potential applications.

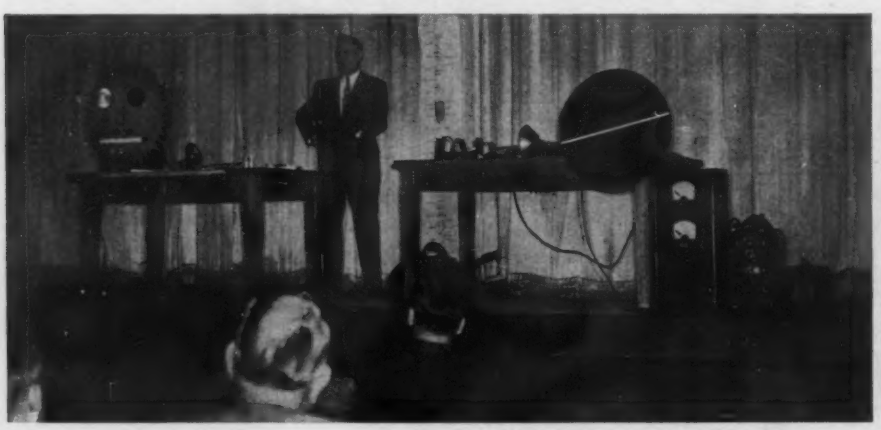
The degree to which already proven electrical phenomena are being applied to new tasks was indicated by Smith in the showing of samples of sandpaper and new types of fabrics where electrostatic voltages of 50,000 to 80,000 were impressed upon fibers and grains of sand to align them properly upon paper or plastics to which adhesives had been applied.

Peculiarities in performance of many electrical materials at sub-zero temperatures are being studied, Smith said, and the resultant phenomena indicate a whole new field of applications.

Most spectacular phase of his presentation dealt with new developments in the wave spectrum. Starting with 60 cycles, he traced the new electronic applications through the light wave bands clear up to cosmic rays. Portable equipment showed radar phenomena and a number of new light sources.

Concluding emphasis was on the

Walter Smith with equipment demonstration



Dr. Woellner

vast unexploited future that lies ahead for the electrical industry and the people who comprise it.

II - Three To Be Served

In the motion picture *Three to Be Served*, the second phase of the program, the experiences of a high school youth and his colleagues in endeavoring to start and operate a basement-type industry was vividly portrayed. The film is sponsored by the National Association of Manufacturers, who developed it to show forcefully the trials and tribulations of management in starting a business.

The picture tells the story of a high-school boy who sets up an insect sprayer manufacturing enterprise in the basement of his home in order to earn money to attend summer camp. Very quickly he finds himself trapped in a triangle comprised of higher wage demands of his school friend workers, the desires of his stockholders for a return on the money they have invested and the assertion on the part of his distributors that the public will not buy the sprayer at the price his costs have established.

With the advice and counsel of one of the community's business men, he learns that the interests of workers, stockholders and customers must be served if a business is to prosper. The picture tells this story interestingly and dramatically.

III - The American Idea

In a fascinating and intensely appealing evaluation of *The American Idea* the ever popular Dr. Frederic P. Woellner, professor of education at the University of California at Los Angeles, left no doubt in the minds of his listeners that a man from Mars, were he to arrive on the earth today, would ultimately select the United States as the place to live. Despite the apparent and imagined shortcomings of the U.S.A., there is no better place to enjoy life, liberty and the pursuit of happiness in the opinion of Dr. Woellner and it was evident that his audience concurred.

Taking his theme from experimental work on the UCLA campus aimed at shooting a man to the moon in a rocket, Dr. Woellner set up a series of standards by which an individual from the outer world, say from Mars, might appraise the 70-odd nations on the earth. He used three measuring sticks —objectives, the means for accomplishing these objectives and the ultimate results. Objectives of the American way of life, he said, are set forth in the preamble to the Constitution. "Don't fence me in" or freedom to live your life your own way, was the manner in which he expressed it. About the only serious drawback he stated were the 2,000,000 laws on the statute books and these only because they tend toward bureaucracy under a theory that when a law is passed a chain is established that involves first a lawmaker, then a bureau, a desk, a stenographer, an assistant, a publicity man and finally a building.

"Objectively, man is the end in the U.S.A.," he said. "Elsewhere he only is the means to an end."

Methods for achieving objectives differ with countries, he asserted. In some one man determines the method, setting up a dictatorship, but since history has proved that few men can be both good and wise, the end result is usually disastrous to the individual and his liberties. In other countries the method is determined by a few, with an aristocratic rule, but if one man can't be both good and wise, Dr. Woellner asked, how can eight assume such a cloak? In a democracy the method is determined by the masses but because human nature is fickle, the American founding fathers modified this system through a republican form in which one group of peoples' representatives makes the laws, another group administers them and a third group interprets them.

As for results he cited Ex-President Herbert Hoover's recent statement that the 6% of the people in the U.S.A. virtually are feeding and clothing the rest of the world. "If Russia or England were charged with this responsibility today," he said, "the flow would be the other way."

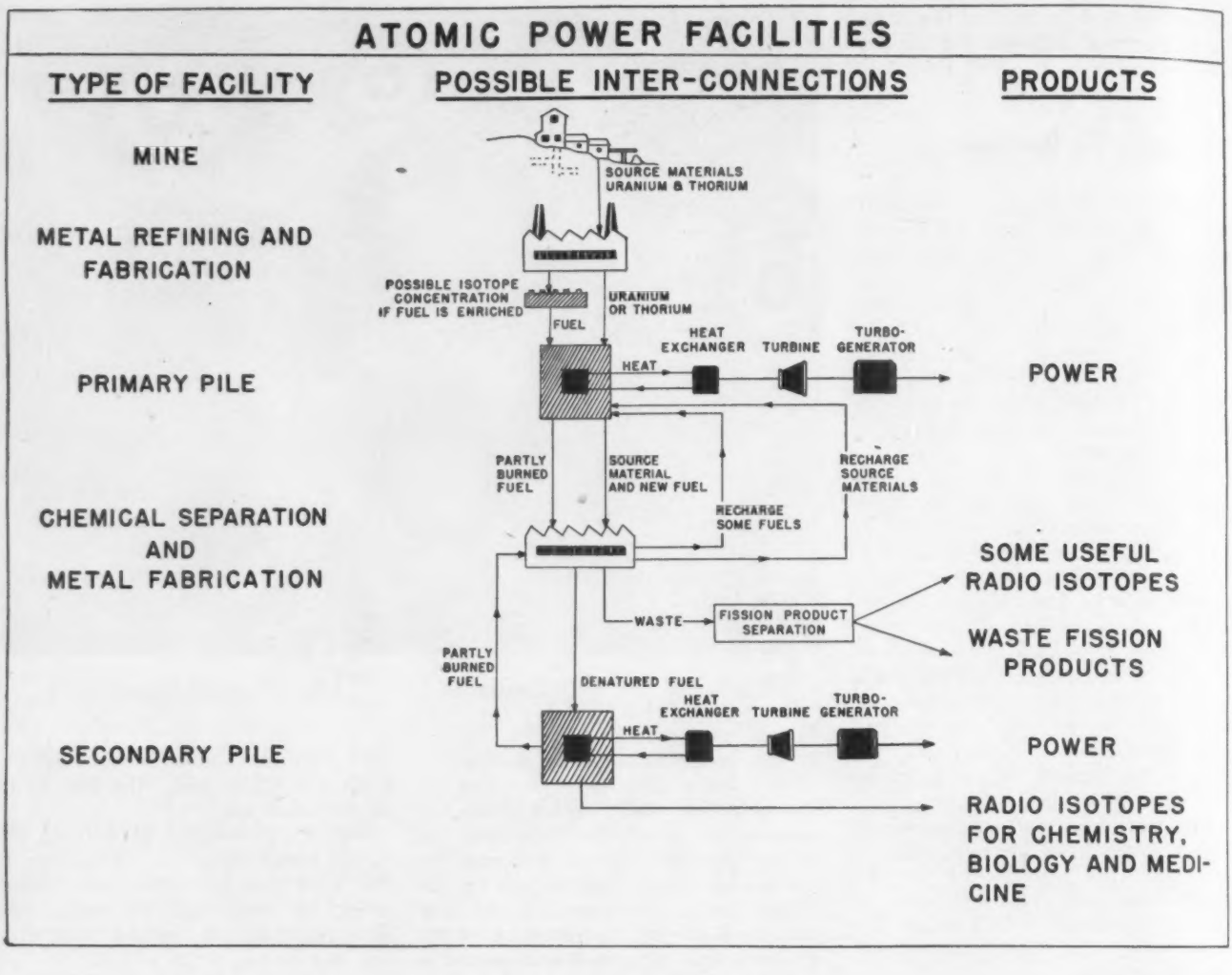
"With a philosophy of working and living based upon life abundance to the least person within our boundaries," he concluded, "our major task is to guard against blasting from without and boring from within."

Miss Fenner Courtright Miss Meeks of Hawaii

Germany in Defeat

SINCE no one in Germany ever meets another person as an equal, but always stratified, either above or below him, the process of teaching democracy there will be exceedingly difficult, Dr. Gilbert Brighouse, professor of psychology, Occidental College, told the Thursday noon luncheon in a quiet address that kept the overflow crowd in rapt attention. Reminded that since the 1917 convention there the United States had been drawn into two wars against Germany, the tragic possibility of another, should the attempts to develop a live-and-let-live democratic philosophy among Germans fail, was a sobering thought.

In introducing Dr. Brighouse, K. M. Ryals, past president, who presided at the noon luncheon, told how Dr. Brighouse had been sent to Germany as part of a psychological research group to study German training techniques and emotional attitudes.



By describing four people with whom he worked while there, Dr. Brighouse made his observations exceedingly real. In each of them, an industrialist, a taxi driver, an intelligent woman interpreter, and a typist, he found the same deeply ingrained conditioning. He found fawning subservience to those they considered superiors and arrogant contempt for those beneath them. This "layering" went through all life—in family relations, schools, business, government. No one was looked upon or treated man-to-man, as an equal.

In such an atmosphere the preparation of a society that considers the feelings and the rights of others is difficult. Dr. Brighouse felt it might take another 50 years, for it would have to begin with a new and as yet unpoisoned generation. It is not hopeless but will depend on the kind of people America and England send over to do the job.

The alternative is grim. The German people are too intelligent, have too much technology to be safe without the re-establishment of moral responsibility and the destruction of their present egocentric inferiority psychosis.

Atomic Power Plants

CONSERVATIVE estimates of the availability of atomic power plants in the electric utility field were given by Bruce R. Prentice, staff assistant to vice-president of engineering, General Electric Co., at the Friday session. A pilot plant now being developed by General Electric at Schenectady may be ready for operation within three to six years, he said. This plant is still in the design stage. A commercial prototype plant of large size might be ready within ten years, he asserted, with atomic power plants a possible major factor in the power economy in 20 to 50 years.

Emphasis should be placed on power phases of atomic fission, he said, because this is the three billion dollar market which may someday support many nuclear energy activities such as applications of radioactive isotopes in the fields of chemistry, biology and medicine, giving great benefits to humanity. In the power generation field, atomic energy will only serve as a substitute for fuel, he declared, and in this respect it must be competitive with other fuel sources. It is too premature to discuss economies of atomic energy as a fuel, although scientists know that 30 tons of fissionable material utilized at peak efficiency would produce the equivalent of one year's electric energy requirements of the U.S., he said.

Prentice listed potential applications of atomic power in the following order of feasibility: (1) land-based power plants; (2) naval vessels; (3) railroad locomotives and (4) aircraft. In the case of ships it would be possible to equip a vessel with a six-month fuel supply. Locomotive and aircraft applications involve many unsolved problems due to weight and radio active by-products.

Many research problems must be solved before any practical power application is possible, he said. Among these he listed control of the chain reaction; economical production of highly fissionable materials such as plutonium; the effects of radiation

on materials; heat transfer from an atomic pile to a turbine; corrosion; shielding and size of units. As these difficulties are overcome, he declared that the nation would be on its way to new peaks in scientific progress.

"Damn it You're a Salesman"

AFTER all the reminiscences, the talk of atomic power, human relations, steam plants, accounting, meters, vehicle laws, two-way radio, transformer oil, power factor, heat pumps, creosoted poles, school lighting and home making classes, Tony Whan walked in with an opera hat and a monocle and told everybody, "Damn it, brother, you're a salesman!"

Tony Whan, president and vice-president, respectively, of both the Pacific Indoor and Outdoor Advertising Companies, acts his speeches, and believes in salesmanship. He believes that everyone has to be a salesman, no matter what department he or she is in. He believes that salesmanship is an honorable profession, that it takes more skill and knowledge even than the law or medicine. He believes that it suffers from too many zombies in it, too many quacks.

During the war and since, when goods were scarce, anybody could sell what there was. But no nation goes back to its former status after a war. There is too much technological progress. This creates new materials and devices and these have to be sold. Producing goods is the easiest part of it. Selling them is different. Sloppy selling habits must be shaken off. Selling is the motivation of products from producer to user.

Whan

It depends on three principles, said Whan. First one must know the product or the service, its uses, its benefits, its qualities. Then one must know the customer and seek to find out his needs. But the good salesman must know himself too, must be able to analyze himself and find out what he did that was wrong, what caused loss of sales. Little things often sink big sales, explained Whan, and listed a number of trivial things, little mannerisms or attitudes that irritate or antagonize.

Telephone manners, natural smiles, enthusiasm are all parts of everyone's selling job, he concluded.

Administrative Services

THAT people are the most perplexing problem of the present day was given silent testimony by the interest and the attendance at those sessions or parts of the program dealing with human relations. If the pioneers were worried about financing, engineering and selling, the sessions of this convention dealing with such parts of the business were often deserted by members eager to attend others dealing with labor, employee training, public relations.

The large, church-like music room of Mission Inn was packed Wednesday afternon when the Administrative Services Section, headed by Leon S. Heseman, California Electric Power Co., chairman, and G. M. Henderson, Coast Counties Gas & Electric Co., held its general assembly on employee training. L. W. Brillhart, Pacific Gas and Electric, was sponsor for the session.

T. G. Gross, instructor of public relations at University of Southern California, preceded the showing of three training movies and also conducted the discussion period when the pictures had been shown.

When America had new frontiers and plentiful natural resources the enterprisers could be indifferent to public opinion and labor, said Gross, for if anyone did not like it he could go elsewhere or seek other resources. But when the industrial revolution came, this independence of action by individuals was lost and those who worked grew increasingly suspicious of business and antagonistic to it. A changing economy has brought need

Maughmer Prentice

to pay attention to relations with people—stockholders, employees and customers, each with somewhat different, yet often overlapping, interests.

Employee training benefits the stockholder by improving the efficiency of the company. It brings out latent leadership. It creates employees who want to work their way up into management. The competitive era ahead will require smart men and women, well-trained ones. The cost of such training, Gross said, cannot be evaded. If it is not done the company pays for it in driblets, poor efficiency, waste, labor turnover.

Employees are a part of the public too. Training benefits them in many ways. Their pooled judgment is better than that of one leader. They benefit from this interchange. With training it is possible to decentralize and put responsibility on employees. Political groups lose no time in training their people. Business should train its organization equally.

How the customer benefits from employee training, said Gross, is expressed by Macy, the New York merchant. The public does not have to buy at any one place, he said. Therefore it is the service that goes along with the product that brings them back. Public relations are good manners. The employee is the public relations contact.

Through the years, Gross pointed out, utilities have won confidence in their securities. Manufacturers have won confidence in their products. Yet both have failed to convince the public that the corporation is a good employer. The public does not have a personal relationship to a corporation as it does to an individual. It doesn't say "my utility" as it does "my doctor."

Two of the training films used by the Pacific Telephone & Telegraph Co. were presented by R. H. Vickerstaff, public information supervisor. The first, *The Tell-Tale Voices*, dealt with voice cultivation and modulation

and its importance in affecting people on the listening end of a telephone. *By Jupiter*, another movie, teaching a lesson in courtesy and control of temper, has also been used effectively. It was prepared by an outside organization which makes it available to anyone.

How to handle the variety of trying situations that passengers lay in the hands of the employees of United Air Lines was well presented in a color movie, *Passenger Service*, shown by John J. Heavey, passenger service instructor, after he described how it was used. A trying or difficult situation is pictured, then projector is stopped and the situation is discussed and analyzed, he said. This stimulates thinking on it and helps to keep it in memory afterward.

The need for refresher training of older employees was brought out in the discussion period at the end of the session.

Accounting Group

Facing a precious Tiffany stained glass window, like a great medallion on the high wall of Mission Inn's Galeria, an art gallery of sedate art objects and ancient paintings, the accounting group read at its center "The Earth is full of Thy riches." Charged with responsibility to watch over such riches—and costs—as the industry has, this group, too, made contrast between the old and new by consideration of machine accounting. How great this contrast is, perhaps did not occur to the practical-minded accountants, whose tedious posting and billing has changed little essentially from the days the monks wrote books in the same slow fashion.

And because there are machines that sort, post, and bill through intricate electrical circuits and relays, the accounting group could now consider a much more minute breakdown of expenses by functions that the slower hand methods could never accomplish practically.

E. C. Bruce, Coast Counties Gas & Electric, was sponsor of this Thursday afternoon accountants session. J. K. Uhler, Southern California Edison, discussed functional accounting which his company plans to initiate with the use of the new machine accounting system it is installing.

Functional accounting, Uhler explained, could be called administrative responsibility accounting. It gives the administrator a breakdown of the expenses of operating his department by functions, so that he can compare their costs with the past and keep abreast of changing costs or trends. It is designed for expense control, not for capital investment. In a utility operation, which differs from simple manufacture, it is particularly useful because a utility engages in so many diverse functions.

Under the system, coded account numbers are assigned departments. The department head determines what breakdowns of expense are of use to him. When they are coded and described in the manual, the man in the field finds it easier to segregate costs and does not need to be an accountant to make his entries.

Where such a system is instituted, Uhler said, it is wise to sell the administrative heads on the system, thoroughly. It is also wise not to try to break down into too fine distinctions lest the employee resort to guessing on quantities of time where a series of operations in a row makes it difficult to ascribe the correct amount to any one part.

Machine accounting was exhaustively reviewed by representatives of the one company which has had experience with it so far, California Electric Power Co. E. W. Miller described in considerable detail the IBM system, its various unit machines, their operation and what they do. He drew attention to the improvement over old hand methods, which required a large staff of clerks doing tedious manual posting, whereas the new machines do all this tedious work electrically and print a clear record besides.

Barney Mieth then told how the company uses the machines on distribution of income and major expense groups. L. B. Reed followed by telling how the machine records are used in preparation of the statement of net income.

Retirement of property by units was recommended by George R. Gray, valuation engineer, San Diego Gas & Electric Co. He discussed this from the standpoint of both Federal Power Commission and California Utilities Commission accounting requirements. Where fixed plant is divided into units and costs are divided into units, retirement of such plant by unit is also desirable. The units should be of sufficient size to justify such grouping, either during construction or for retirement.

Gray emphasized the necessity of acquainting the operating personnel thoroughly as to the need for it, and why it was wanted. When they understand, he said, they give the plan their cooperation. Selection of units is important, and operating personnel can help to make such selection. Those things that are normally installed and removed about the same time should be grouped, not those which have differing lives. Some people go to extremes in proration, he felt, and this is not necessary. Men familiar with property, equipment and construction should aid in arriving at units.

Three departments should participate—the engineering department because it keeps accurate records of all equipment; the construction accounting department; the evaluation department. Gray recalled how the valuation of 1915 had provided the San Diego company with valuable guide data in determining units.

Heseman and Henderson, Administrative Services chairmen, contemplate—

Gray's approach was thoroughly practical and he urged reasonable interpretations and adjustments rather than any attempt to set up rigid procedure that might not fit all contingencies.

Credits, Collections

The Credits and Collections Group, with E. J. Wright as sponsor, launched its discussion with the question, "Are Applications for Domestic Service Necessary?" The question referred to an application signed by the customer. After G. T. Dorrance, Southern California Edison, had presented his paper on the subject, informal discussion quickly tied all new service and collection problems together.

In this context, the group as a whole was strongly in favor of streamlined procedures, with a minimum of formality and routine in the handling of both new services and collections. Particular interest was shown in the plan introduced by PG and E in one of its divisions, whereby collectors were called together and informed that from that time on they would be known as credit representatives.

There was more to this than just a change of name. The company let it be known that it felt these men had done a remarkably good job, and that the change was to emphasize the fact that their assignment would be to find out what was preventing delinquent customers from paying on time and what could be done to help them out, rather than simply to collect a bill. The system appears to have brought excellent results, actually improving collections while at the same time building good will.

Generally speaking, the group felt that meter deposits for residential service are unnecessary. It was brought out that as a point of fact they are now required only in a very few localities.

Business Development

A SMALL theater had to be borrowed for both Wednesday and Thursday afternoons to accommodate the Business Development Section program, for which K. L. Hampton, Valley Electrical Supply Co., Fresno, was chairman and E. W. Meise, San Diego Gas & Electric Co., vice-chairman. And during those two afternoons the whole gamut of commercial activity in the electrical business had to be dealt with—home appliances, school homemaking, farm electrification, table appliances, reverse-cycle heat pumps, industrial power factor, school lighting and even sales policy.

Marguerite Fenner, PG and E home economics director, winner of the McCall Award, opened the program with a feminine touch and a woman's point of view on selling that the men salesmen should heed. Citing the familiar 85% figure for all retail purchases for the home as made by women, she said the sales job of every manufacturer, distributor, dealer and utility was to make friends with women and to influence their buying. This job, she continued, "is a natural for the home economist, first, because she is a woman and speaks a woman's language; second, because of her specialized training in home making; third, because selling is her business"—subtle selling, that is.

Today's home economist does more than make home service calls on range users, she said. She is expected to know all the answers on a long list of subjects, sell this information to a large mass of consumers and interpret it in a way that will ring up kilowatthour and appliance sales.

Miss Fenner then made an interesting point. She said that presentation of information must be glamorized because a woman likes to identify herself with her dreams of things better than those she has. "It is far easier and much pleasanter to identify herself mentally with Myrna Loy or with a pretty, young woman 'to whom things happen' than to an overworked drudge with six kids—even though she is an overworked drudge with six kids."

Showing color slides Miss Fenner explained how these were employed to help women to dream of better homes and better ways of running them with the aid of appliances, lighting, kitchens and deluxe home laundries.

Lloyd Bowles, as school counselor for Southern California Edison, discovered how ancient the cooking equipment was in the home making departments of schools he visited. He also discovered that girls were not taking home making classes because of this handicap. Interested school officials asked his help in making attractive and in modernizing the entire home making class rooms.

Edison's staff prepared plans for remodeling and re-equipping. Then it contacted manufacturers and obtained special school use prices for equipment and now aids school boards to obtain these appliances, set up truly modern departments, well equipped with the appliances and facilities that girls will be using in their homes in the future. (A complete story on this work will appear soon in ELECTRICAL WEST, written by Bowles.) The scale model of a home making department, first presented to the convention of the California Home Economics Assn. at Pasadena, May 30-June 1, was shown by Bowles to this convention as well.

Forget all this distinction between the major and the small appliance, B. A. Graham, president of Sunbeam Corp., Chicago, told the convention. In telling why, Graham presented interesting tables showing the numbers of

—the people who make up the electrical industry, represented at the convention

so-called small appliances in use, their approximate hours of use, the current consumption of each, the block of the rate they come under, and estimates of the revenue they represent.

So-called major appliances probably accounted for $129,758,000 in revenue last year, he said, but small appliances, not including coffee makers, shavers or blankets, accounted for $142,000,000 and radio and fans another $105,000,000.

Graham was enthusiastic about the possibilities for sales and revenue from the automatic coffee maker. He spoke of the amount of coffee drinking Americans do and what a market this represents. He said a smart appliance salesman could sell eight coffee makers in the time it took to sell one range and would earn him more commission. (More of Graham's talk will appear in a later issue).

Then and Now in Agriculture was a motion picture composited of one made to promote farm uses of electricity many years ago, in which R. E. Fisher, vice-president of PG and E, acted the part of the farmer, and a recent moving picture in color produced by that company showing modern farm uses of electricity. In it E. G. Stahl and Marguerite Fenner take leading roles and Dr. Walker is shown teaching a class at Davis.

Heat pumps for house heating and cooling were discussed with utmost frankness by W. L. Holladay, Drayer-Hansen Inc., one of the few manufacturers making this type of equipment in packaged units. Much of what Holladay had to say has just appeared in an article on heat pumps in the May issue of ELECTRICAL WEST.

The principal application of this type of heating and cooling, he declared, will be in commercial occupancies where there is need for both heating and cooling. Its use in the home is still in a luxury class. Although the first cost and installation runs about that of any other heating and cooling system, its primary place will be where the owner can make money by having heat or cooling, and where there is sufficient room to install and insulate the equipment. There were about 85 installations made in California in 1946, 29 in desert areas, 50 in commercial buildings and only six in homes. These are actual sales, not experimental tests. An eight-room house will use about 1,000 kwh. a month to operate a plant, the equivalent of several ranges. Holladay said the industry needed many more manufacturers in this field to stimulate its growth and development.

Industrial power factor problems, discussed by R. K. Collins, Westinghouse Electric Corp., provided the industrial sales story of the convention. Collins used demonstration equipment to show what poor power factor did to a system. He stressed the importance of correction both to the utility and to the industrial plant. He analyzed causes and suggested solutions.

Causes mentioned by him included improper selection of motors and starting characteristics, over transformering, electric welders. Cures include capacitors and synchronous motors. He told how to locate capacitors with respect to loads, illustrated what happened when they were improperly installed. He urged study of customer plant distribution and rates in the redesign of systems to correct poor power factor.

That utility companies do not seem to have realized that they are businesses and require a concrete sales policy, was the thought explored by George N. Hawley, Southern California Edison Co. For a long time this industry had been so without selling aggressiveness that the utility industry came near being soaked up by government as it has been in Europe. To maintain its private status, "to survive as an integral part of the free enterprise system, meant a tremendous redirection of thinking, and a complete re-equipping of the industry with all of the trappings of modern private business.

"There are two ways to get people to take action. One is by law, the other is by personal influence. I pay my taxes because I am compelled to do so. I buy my Coca-Cola and my Lucky Strikes because personal influence makes me want them more than the money."

Hawley contended that selling policy has largely been experimental rather than consciously thought out. Whether or not a utility merchandises has been more experimental than not. But despite the heavy demand for electricity he gave figures which showed that its rate of increased sales have not kept pace with those of other commodities. His conclusion was that selling policy among utilities is still in process of evolution but that there is decided need for genuine sales action.

Hampton Meise

John Walsh, Pacific Gas and Electric Co., told the convention the program his company has been working on to relight schools, a story which is reported in the June issue of ELECTRICAL WEST. In telling it he spoke of the Chico remodeling project and how one model school is planned for each county seat.

Since a conference of school executives is to be held in San Francisco Sept. 29, Walsh urged the entire industry to form a committee to prepare and present a story on the relighting of California schools to that gathering. He urged that an exhibit be prepared to show visually what could and should be done.

Operating Economics

THE Operating Economics Section, C. J. Nevitt, chairman, opened up with a series of parallel sessions.

T. A. Bettersworth was group leader for the transmission, distribution and safety meeting, which first took up several aspects of the pole problem.

"Pole Timber Resources and Forecast of Pole Supply" was summarized for the group by F. B. Doolittle, Southern California Edison Co. Doolittle drew upon findings of the American Forestry Assn. survey of 1946, sponsored by EEI and the Association of Edison Illuminating Companies, in developing his over-all appraisal of the pole-supply situation.

Potentially, he reported, there are ample supplies of both trees for poles and coal tar for creosote—the pole and its preservative being closely related in any long-time prediction. But poles themselves may remain in short supply through difficulties in obtaining labor for the preparation of poles, even though manpower may be available for felling and logging. Creosote may be difficult to obtain because the coal tar from which it is made is an economical fuel for steel mills.

Throughout the nation, the American Forestry report showed 683 million trees of pole size in the forests of the recognized pole producing regions against an estimated requirement of 60 million in an 11-year period ending in 1956. Most types are plentiful. An exception is Western red cedar.

Given these adequate material resources, Doolittle predicted that a free economy would produce to equal demand, competition determining price.

Against this background of present shortages and future prospects, two papers were presented on various aspects of treating poles with petroleum-creosote mixtures. These are published on pages 58 and 59.

Ernest Wright, PG and E, inquired as to what the men who climbed the poles thought about the various treatments. Experience seemed to be that there were good and bad poles, from the climbing standpoint, regardless of treatment, but that petroleum tended to bleed. W. H. Seaman, So. Calif. Edison, said this varied with the particular oil used. Clive Baugh, PG and E, mentioned that results appeared to be a function of both the particular oil and the particular treating process, minor variations in either producing very different results, even within the same specification.

Connection and disconnection of static capacitors and self-protecting transformers was the subject of a panel discussion. F. E. Miller, PG and E, reporting on banks in the San Joaquin division, using bleeders and a variety of control methods, said within bank sizes there encountered, voltage rather than kva. rating determined the breaker rating on banks so switched. They use 150,000-kva. breakers on 4,800-volt banks, and 250,000-kva. breakers on 13,200-volt banks.

H. E. Jung said So. Calif. Edison has heretofore connected capacitor banks by bayonet-type fuse holders, but oil disconnects are now being added on 11-kv. banks, because of difficulties in breaking fast enough by fuse pulling with hot-line tools.

In regard to safely connecting CSP transformers, there was interest in the procedure described by W. J. Walsh, San Diego G&E. That system first ties one primary lead to a temporary insulator, then transfers it to line after the other lead has been connected. Miller said PG and E uses a wood-stick stirrup to accommodate the first lead to be disconnected, until the second lead has also been disconnected.

This discussion added significance to the safety program which followed, because most utility fatalities have occurred in the course of line work on poles, and because the variety of described methods gave weight to safety men's view that more uniformity is needed.

A paper was read for E. C. Hunt, PG and E, on "Possible Standardization of Safety Rules and Regulations Among Member Utilities." This lead the group to recommend establishment of a committee for each state to work toward common rules and standards.

Lloyd Bowles unveiled the model home economics classroom for all schools

W. M. Nott, Meter Group leader, introduced a series of discussion leaders who led informal conferences on instrument transformer and meter test practices, and on group operating procedures.

E. B. Kipp, San Diego G&E, pointed out the defects in the old NEMA instrument transformer classifications, and the superiority of the new ASA standards in describing transformer characteristics more accurately, limits being established for ratio-correction factor over a power-factor range of 0.6 to 1.0, and ratings being extended to heavier burdens.

Methods of testing transformers in the field were discussed, and it was agreed that such testing is limited by the type of equipment available. Most satisfactory and accurate results are obtained by bringing the transformer into the laboratory. The effect of lead resistance on phase angle and ratio was discussed, particularly as to potential transformers connected in open delta. No good answer to this problem was forthcoming.

W. C. Gallatin, Westinghouse, described various types of loading devices for field testing of single-phase meters, and subsequent discussion covered both phantom and resistance types. Consensus was that light, flexible equipment is very much needed.

F. A. Redding, So. Calif. Edison, described facilities of the National Meter Committee for gathering information and setting up standards. Those present who are West Coast members of this committee expressed a desire for cooperation of the Meter Group as a whole in carrying forward the activity. This led to a discussion of the Meter Group's structure, which, it was felt, lacked the continuity necessary to initiate and carry through long-range studies of regional metering problems. A committee was appointed to develop recommendations for a more effective unit.

First on the Hydroelectric and Substation Group program, led by W. T. Johnson, was a panel discussion of the question, "What Types of Battery-charging Equipment Should Be Selected for Station Control Batteries" The answer seemed to be: it all depends. Phillip P. Nevin presented a summary of So. Calif. Edison practice. That system uses m-g sets with electronic voltage control on the generator for 60-cell batteries, omits the voltage control in the case of smaller, lower voltage batteries at attended stations. Present standard for lower voltage batteries, however, is a stabilized, full-wave selenium-bridge rectifier.

H. T. Sutcliffe reported that PG and E practice is to use dry-disk rectifiers in small unattended stations where battery duty is limited to steady switchboard load plus no more than tripping duty where oil breakers are involved. Tube rectifiers are used in small to medium unattended stations where breaker closing and operation of automatic switches or other devices are involved. M-G sets, preferably diverter-pole, are preferred in large attended stations where duty is heavy. The system has not made widespread use of automatic regulators or automatic chargers.

"The Future of Inhibited Trans-

Official Photo

Copies of the official convention photo may be ordered from the Field Studios, 3616 Main St., Riverside, Calif. Price $1.50; payment should accompany the order. Copies of the separate picture of the ladies attending the convention may be secured from the same source at $1.

Vickerstaff Kenyon Brillhart Gross Heavey

former Oils" was discussed by Dr. R. G. Larsen of Shell Development Co. Deterioration of oil in a transformer results from contamination by water and dust, and from internal changes through which lead particularly to the formation of sludge, acid and peroxides. Sludge interferes with cooling, acid stabilizes water emulsion and corrodes the transformer case, while peroxides attack cellulose insulating materials.

An inhibitor is designed to inhibit these internal changes without adversely affecting the properties of the oil. He reported development of an inhibitor which is very similar to oil itself yet improves oxidation stability 100 times, in laboratory tests. In a comparative test on a 5-kva. pole-type transformer, for one year at 90°C, conventional oil developed the aforementioned shortcomings to a considerable extent, whereas inhibited oil did not form sludge or oxidize. Core temperature had increased 10°C with conventional oil, but only 1°C with inhibited oil. Inhibited oil may be blended with conventional oil without adverse effect, he said, and no inhibitors were found which were incompatible. He predicted widespread use of inhibited oils.

At a meeting of the section as a whole, Ben L. Stovall presiding, electrical and mechanical design features of So. Calif. Edison's Redondo steam plant were discussed by F. G. Philo and H. A. Lott. Philo said design was influenced by the fact the plant will be required to pick up from 5% to full load instantly, and for this reason some features of base load plants in the East were not incorporated. Most

Stovall Nevitt Woodman

talked about was the provision being made for reversal of the condenser cooling water every two hours. Two 10-ft. diameter tunnels will extend 1,800 ft. out into the ocean. Reversal of flow will cause temperature change which should kill most of the marine life; this, coupled with reversal itself, is expected to obviate nearly all marine-life troubles experienced in the past with sea water cooling.

The plant will initially contain two 60-000-kva., AIEE, ASME standard units driven by 3,600-rpm turbines operating at 1,000 psi and 900°F. Oil will normally be burned, but there are provisions for both natural gas and coal. Two 69-kv. lines will transmit power 5 mi. to La Fresa substation, where it will be fed into Edison's 220-kv. system. Because of salt fog, bus insulation and breaker and transformer bushings will be of 115-kv. rating. Eventual plant capacity will be four units; operation of the first two is scheduled for January 1948. ELECTRICAL WEST will publish a detailed description of Redondo in the September issue.

Employee training programs came in for a round of discussion with reports from Roy E. McCann, So. Calif. Edison, Paul Suransky, PG and E, and M. E. Musgrave, San Diego G&E. McCann said Edison had graduated 207 linemen in four classes since the June 1946 opening of its very comprehensive training school, which covers 14 acres and contains specimens of every type of construction used on the system from secondaries to 220 kv. Nineteen cable splicers and ten estimators also were trained. Ninety per cent of all were ex-service men. Emphasis on job relations and job instruction was the key to success, he said.

With 9,000 mi. of electric extensions to be built by the end of 1948, PG and E launched a division-by-division training program for linemen, foremen, estimators and right-of-way men. To make sure that estimating and securing of right-of-way would not be bottle-necks, the company emphasized these categories, operating four schools. By intensive training, Suransky said they could make apprentice linemen in 12-18 months instead of the normal 30 months. To date, 187 apprentice linemen have been trained, and the men assigned so as to dilute regular line crews and thus stretch the effect of training.

San Diego patterned its program after the Edison school. Training period is 16-18 weeks, Trainees, instructor and management are all very enthusiastic. Secret of success is the able instructor they have and the emphasis placed on job instruction and job relations, according to Musgrave.

Northwest Accounting

A display and demonstration of new accounting machines and equipment was a featured innovation at the annual meeting of the Accounting and Business Practice Section, Northwest Electric Light & Power Assn., at Salt Lake City, May 21-23. Eight of the leading manufacturers of such equipment sent their latest models and people to demonstrate them in a session given over wholly to such demonstrations on the afternoon of May 21. The following day, three manufacturers' representatives were programmed in the business sessions to point out the particular applications of their new equipment to utility accounting.

The meeting was under the chairmanship of Henry Mann, Utah Power & Light Co., and its program included discussions of classification of accounts, property and depreciation accounting, customer's accounting and collections, and general accounting, beside the machine demonstrations.

In his welcoming address, George M. Gadsby, president, Utah Power & Light Co., pointed out that we are entering a change in economic conditions. Accountants will have to study trends, figure what is going to happen and recommend what management should do about it, he said. Accounting executives must originate over-all programs in the field of finance and operation, and management will welcome having such programs for consideration by the responsible heads of companies and boards of directors. T. W. Fryou, Portland General Electric Co., responded to this address.

The new 9,100 figure writing, adding and addressograph machine of the Addressograph-Multigraph Corp., was explained by C. F. Margach, Cleveland. In addition to the addressograph plate, the machine carries a separate sensing card or plate, produced by a motor operated key punch. Its application to the production of dividend checks, showed the machine producing 5,400 checks per hour complete with check number, date, number of shares, amount and signature, and at the same time printing and adding a journal register control.

H. S. Gifford, IBM Co., Dallas, Tex., in telling of new developments by that company last year, said they were based on two definite objectives: (1) to mechanize all routine clerical operations; (2) produce accounting machines capable of broad utilization on all phases of accounting, or as an integrated accounting machine unit for all functions. He announced the new alphabetic collator, the 519 end printing reproducer, the Type 404 alphabetic accounting machine, the 602 calculating punch, and the 603 electronics multiplier. This latter machine, he stated, could multiply 6 digits by 6 digits at a speed of 6,000 items multiplied and recorded per hour.

J. W. Hill, Remington Rand Inc., San Francisco, displayed and talked on the application of new Kardex equipment. Other demonstrators of new equipment were Burroughs Adding Machine Co., Friden Calculator Co., McBee Key Sort Co., Monroe Calculator Co., and National Cash Register Co.

A discussion of depreciation accounting lead by E. F. Heim, Utah Power & Light Co., brought out the systems in use by member companies and present-day trends. Some disagreement developed over the proposed practice of showing depreciation reserve as a deduction from plant account on the asset side of the balance sheet. Preponderance of opinion was that this method of reporting depreciation might lead to erroneous interpretation of the balance sheet.

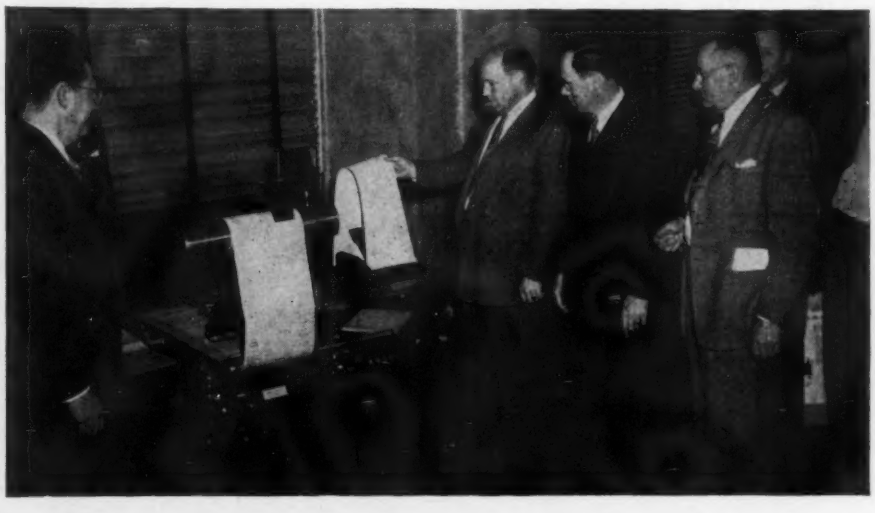
New wrinkles in customer's accounting and collection were discussed under the leadership of J. E. Winton, Washington Water Power Co., bringing out some of the following points: collections are expected to grow worse as time goes on and all companies are stiffening up their collection procedures; some companies have eliminated prorating of part-month bills; most companies are finding pay stations increasingly advantageous; there is a trend toward Saturday closing of offices and regular rest periods during the day for employees. As a corollary to this last, some companies are considering putting in coffee bars in their own buildings. A study by one company of accounts on which federal energy tax had been paid revealed a payment of $4,000 in error on accounts not taxable.

With V. T. Montgomery, Idaho Power Co., in the chair for a discussion of general accounting, Ellis Anderson of that company showed some of the preliminary microfilming of company records. Approval from the FPC and state commission of Idaho has been received for microfilming, cash vouchers, journal vouchers, canceled checks, bank statements, purchase orders relating to fixed capital, and canceled stock certificates. A total of 3,100 impressions has been placed on a 100-ft. roll of 16-mm. film at an average cost including preparation of about $4.90 per thousand.

Allan Elder, chairman of the classification of accounts committee, reported his committee had rendered one opinion recently and invited questions on borderline cases of interpretation.

Winton Mann

Margach Halliday Fryou Mann Holland



Return of Competion, Not a Recession, NEWA is Advised

Business uneasiness unfounded, Pacific NEWA meeting hears

R. A. Balzari, secretary, and Charles Goodwin Jr., chairman and the Theme

Looming up in American business today is an unfounded feeling of uneasiness caused by the reappearance of competition, according to Barrett Green, vice-president and economist of the Seattle National Bank of Commerce, in his speech on economic conditions at the Pacific Zone Convention of the National Electrical Wholesalers Association on June 4, 5, and 6, in Victoria, B. C., presided over by Charles W. Goodwin Jr., General Electric Supply Corp., San Francisco.

"We are now having an unparalleled prosperity," said Green. He showed the group figures proving that retail sales are still climbing, employment is at a satisfactory level, production is continuing upward, and national income is increasing.

Recognizing the need for changes in industry, Green pointed out that adjustments can and are being made without upsetting national economy. Changes will be made, he said, over a period of time thus cushioning the shock to the nation as a whole.

NEWA President E. B. Ingraham, Times Appliance, New York, and W. E. O'Brien, Toastmaster sales manager

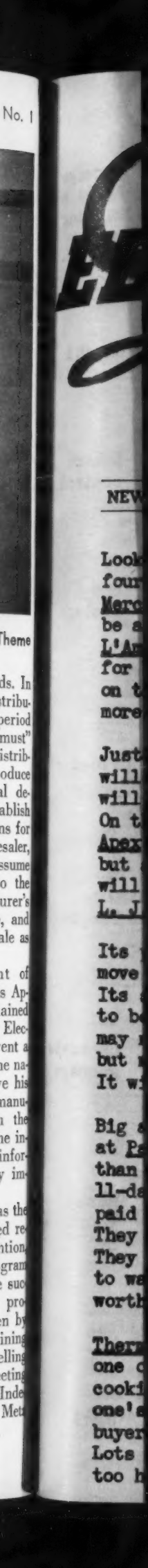
An over-all picture of the business outlook and detailed studies of the electrical wholesalers current market highlighted the convention. Nearly 150 members and their guests met in the impressive Empress Hotel for the first convention in which wholesalers of the eleven Western states were recognized as a zone, rather than a division, of the national organization.

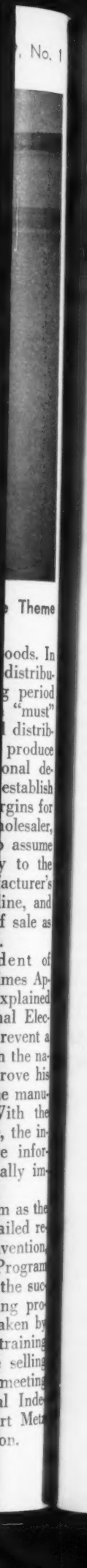
The first general session opened with a welcome by W. C. Mainwaring, vice-president of the British Columbia Electric Co. Speaking to the wholesalers on the use of aluminum wire in the building industry, Don B. Karlskind, Pacific Coast district manager of the U. S. Rubber Co., stressed the importance of aluminum as an adjunct to copper wire, and analyzed the properties, carrying capacity, and economy of aluminum for electrical use. J. H. Polhemus, president of the Portland General Electric Co., reviewed the electric supply situation in the Northwest. R. A. Balzari, secretary of NEWA's Pacific Zone, handled all convention arrangements.

Speaking on appliance distribution, W. E. O'Brien, sales manager, Toastmaster Division, McGraw Electric Co., Elgin, Ill., told wholesalers it is not probable that there will be an appreciable reduction in the prices of electrical appliances under present conditions. He emphasized the tough selling job ahead in which the distributors must help the dealers move goods. In explaining the manufacturer-distributor relationship in the selling period ahead, O'Brien laid stress on "must" for both the manufacturer and distributor. The manufacturer must produce quality products, create national demand by advertising, and establish prices that allow adequate margins for distributor and dealer. The wholesaler, on his part, must be ready to assume responsibility for selling only to the outlets supporting the manufacturer's policy, keep his margins in line, and aid the retailer in his point of sale as well as management problems.

The newly elected president of NEWA, E. B. Ingraham of Times Appliance Co. Inc., New York, explained the importance of the National Electrical Wholesalers Assn. To prevent a period of under consumption in the nation, the distributor must improve his techniques in order to equal the manufacturer's production rate. With the improvement of this technique, the industry's ability to interchange information through NEWA is vitally important, said Ingraham.

Closing the session. Ingraham as the guest speaker, presented a detailed report on the Atlantic City convention, including an outline of the "Program of Progress." He reported on the success of the EEI-NEWA training program which has so far been taken by 60,000 salesmen, the plan for training distributors' salesmen in store selling techniques, concluding the meeting with the speech on "Electrical Independence" prepared by Herbert Met for the Atlantic City convention.





ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

Midmonth
July
1947

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Look for your electrical appliance exhibitors on the fourth and fifth floors of the San Francisco Western Merchandise Mart, for by Market Week, Aug. 4-9, they'll be all reshuffled and relocated there, said George L'Amoreaux, of the Mart. Many will have larger space for better exhibits. Others, temporarily camping out on the second floor or elsewhere, will have moved into more permanent quarters.

Mart ready

Just as examples, Hotpoint and Premier, and Telechron will move up to the fifth, LeRoy Bennett with Monitor will come down from the sixth; Frigidaire remains there. On the fourth Westinghouse will move to a new big corner, Apex moves too, Frank Edwards and Deepfreeze likewise, but all on the same floor. Kelvinator, Thor and others will still be on the fourth. Manning Bowman will be in. L. J. Meyberg will expand.

Changed places

Its putting a strain on everyone to shift around and move into the new quarters in time for Market Week. Its something of a miracle that the big new wing is to be finished at all in time. Some of the exhibitors may not have things altogether the way they want it, but most of them will have something new to show you. It will be a worthwhile market.

No dinners

Big appliance event of last month was the Home Show, at Pan-Pacific Auditorium, Los Angeles. Even bigger than last year, crowds poured in every one of its 11-day run, 10,000 a day, and more on weekends. They paid 80¢ admission. They listened to everyone's pitch. They took home literature. They entered contests. They ordered merchandise. A pictorial story of it has to wait until next issue of Electrical West, but its worth waiting for. There were some fine display ideas.

Home show

Thermador, with its new sectional electric range, was one of the really new products shown. Separate ovens, cooking top and griddle top that can be set into anyone's cabinets, at any height or location to suit the buyer, had the architects excited and the women too. Lots of them have been complaining about low ovens or too high cooking surfaces.

Adaptable

Garbage disposals had a hey day. Waste King, Los Angeles made by Given Mfg. Co., had crowds jamming its spectacular demonstration pitch and the kids got a kick out of a circus Waste King walking about. Across the main aisle aways Nelson R. Thomas Co. was doing another pitch with the Drain-o-matic, made by Rouselle Corp. of Burbank.

Garbage takes a beating

Another "new" was Trade Winds kitchen ventilator that is like a long shelf just a few inches off the cooking top of a range to pull the steam, fumes and odors away quick without touching the walls.

Whish!

Touch Plate wiring had people trying it. Its the relay system by which lights and things are controlled by touching a plate which uses low voltage to do the switching through relays—the kind that's in the Fritz Burns Postwar House.

Button control

First time seen out West was the Ingersol central core that contains all plumbing, furnace, water heater and wiring, and that provides for a compact kitchen on one side, a bathroom on the other. Bandoli McIntyre Co. showed this at the Show, are agents for it in southern California. It's a natural for low cost housing and a package deal.

One package

Television was all over the show. A portable televisor rolled around the show itself shooting the demonstrations and the crowds. People could see at the Stewart Warner booth of Kinney Bros., or at L. J. Meyberg's RCA-Victor showplace and others. Local stations beamed sports events.

Video

Not "A Radio for every room," but "A Radio for everyone—everywhere" will be the Radio Mfg. Assn. slogan. At its convention recently it looked at its increasing inventory, decided this new slogan had a more human appeal.

People

General Electric may break out with a separate sales program on its garbage disposal. The market seems hot for the appliance and to wait for sinks and dishwashers to catch up in production may take awhile that could be spent in making the most of this public interest.

Separate garbage

Jacobs' Launderall will be pushed for self-service laundries with less strings attached to the deal, that company has announced. Its program will be supported by planning service and advice. Dealers and distributors are to be briefed on the plan soon.

Wash your own

Hoover Co. is said to be working on a tank type cleaner and an electric iron that may be announced soon, August 20 in fact.

New

Westinghouse regretfully announced that despite its good intentions to hold the price line, it would have to up the refrigerator prices 3.75%.

Ugh!

Brewing

In order to do a real job of promoting along with the introduction of its new automatic coffee brewer, Cory announced a policy of hitting one market at a time with it so as to provide dealers with enough stock to make a splash when the turn was theirs. The deep South was first.

Improved

Tricky new "broiler'n'cooker" is announced by National Stamping & Electric Works, subsidiary of Eureka Williams, to sell at $28.50. It has open sides and a hinged top to contain smoke and fumes. The pan can be put in five positions. Has the White Cross trade name, UL approval.

Correction

W. L. Hahn of Maytag West Coast Co. corrects us to say that Maytag's equipment isn't "redesigned," it's just designed but good and is coming in increasing volume. This goes for its new freezer and its gas stove as well as the well-known washer.

About time

It's not too early to begin thinking of Christmas merchandise, especially the really clever new Eddy Christmas tree strings of lights that are arranged from a central trunk to conform to the limbs of a tree. Made by Eddy Mfg. Co. of Hayward, Calif., Fink-Taylor Corp. of San Francisco are agents.

Advance showing

Philco took over Earl Carroll's showhouse in Hollywood to introduce through Gough Industries, its distributor, 38 new radio and phonograph models, five new auto radios, and a refrigerator with a new electronic temperature control and other features. Cliff Bettinger, western division manager of Philco had Fred Ogilby, factory sales manager, along.

Catalog

Ray Jones, washing machine parts distributor, has just issued a new illustrated catalog. This Denver dealer in parts has one of the most complete stocks of all makes of parts in the West.

Really in radio

Remler, the electronics manufacturer of San Francisco, is adding to its Scottie line of portable radios a new chairside phono combination and a tricky little table convertible radio-phonograph. It will soon have two console models and two new portables, one with battery only, one a three-way set. Price range will run from $191.95 to $300 for the deluxe combination with FM. Jack Totten has been put in charge of radio division.

Cost ratios

Inland Empire Electrical Dealers Assn. is doing some really valuable research for its members in the Spokane area. It has recaped the 1946 cost ratios of dealers up there, found net profit 10% of net sales last year, but shows members that was because selling costs last year were so low. Operating and selling costs in 1947 are on the up and so it warns to watch administrative expenses; keep them down!

Certified lamps—table, end table and floor lamps that are the successors to pre-war IES—will hit the market with a National Certified Lamp Week, Sept. 3-13. It will allow retailers to show the new lamps simultaneously at the peak of a big advertising campaign. The trade can see the lamps at the Chicago and New York Shows, and possibly some will be shown by exhibitors at the San Francisco Market, Aug. 4-9.

CL soon

Some new developments in radio and phonograph engineering are promised in Admiral's new line, Kaemper-Barrett, San Francisco distributor declares. Also some lower prices. Newest wrinkle is a tone arm with a snap-in cartridge, utilizing conducting rubber instead of crystal. Has a new system of FM too. A little portable is called "The Thin Man."

Snaps in

Simmons says it has improved the balance between its electric blanket and its control to assure positive warmth control, taken the noise out of its relay, and now uses an improved blanket wire.

14 points

Frigidaire is springing its long awaited line of home laundry equipment in July. It included a "revolutionary" automatic clothes washer, and automatic dryer and an ironer. Both washer and dryer each retail at $299.75, the ironer $189.75. Distribution at first will go to a limited number of dealers, then as they get rolling, to the entire list. The washer has been in development for 10 years, is fully automatic, uses a "live-water" action, is top loading.

Here they come

Another simplified name change. Galvin Mfg. Corp. has changed its name to Motorola, Inc., which is what the trade liked to call it anyway.

Easier

Without any publicity, interest rates are being moved up a notch or two by the banks, if you've noticed. This may be toughest on the small operator.

Rise in %

Reason there were no pages 121-124 and no Sales Guide News-Letter in your last Electrical West is that the printers took us off guard by getting the issue printed early, first time since the War. The News-Letter, usually prepared in plenty of time, with the later news by photo-lith, missed the binding date. Most of the issue was devoted to quick reports of things revealed at the San Diego Bureau of Radio & Electrical Appliances big conference, which is reported in full in this issue.

Is our face red!

S&M Lamp Co. has reduced prices of several of its Red Cap general purpose flood-lites which many a dealer sells as much-in-demand over-the-counter merchandise. They are handy for garden and sports lighting.

Outdoor season

Another wave of increases in wages for electricians swept the West coast beginning June 1, in spite of its effect on home building, which is slowed almost to a snail's pace. Makes appliance installation cost go up another notch.

Another hike

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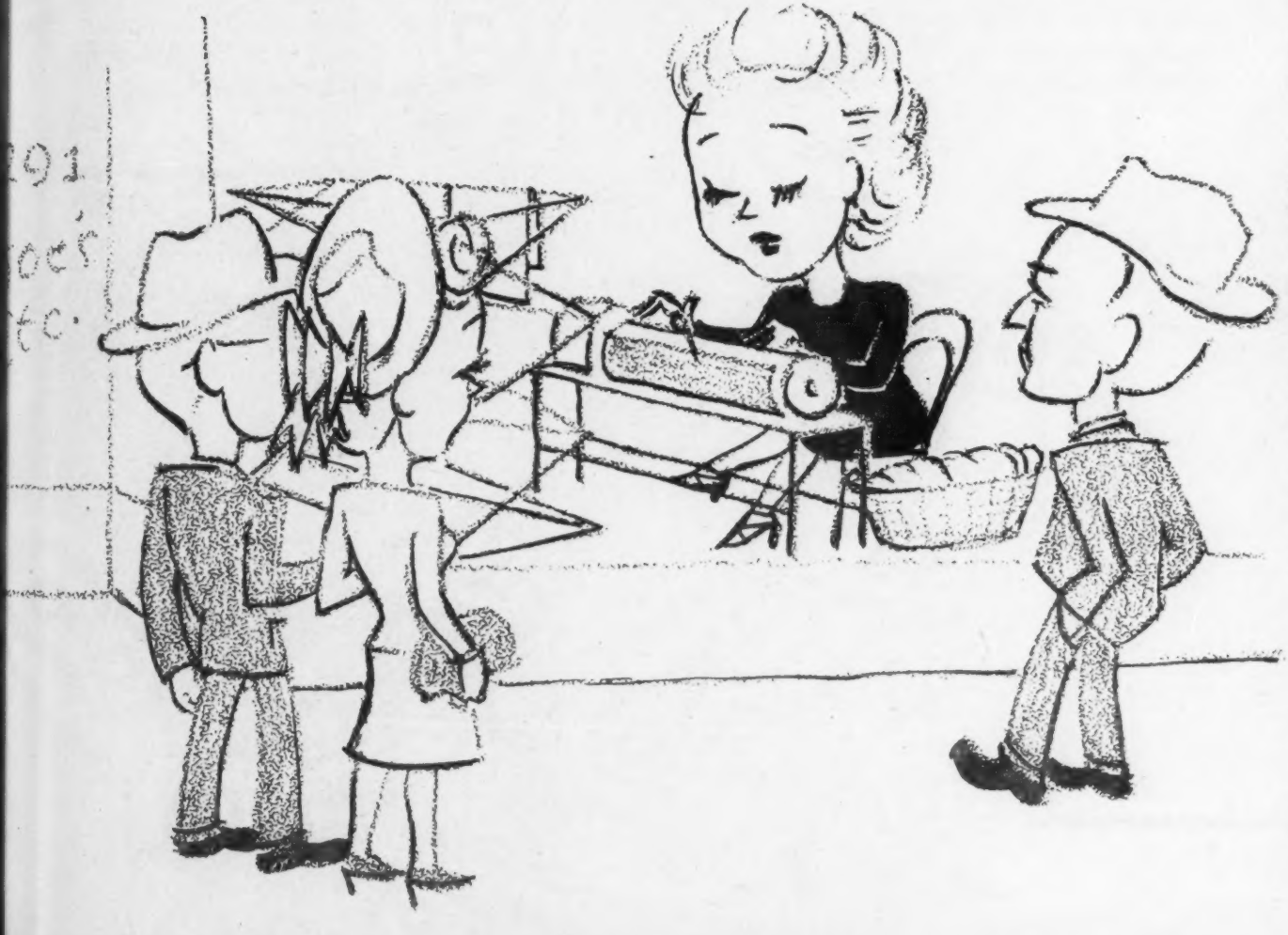
ELECTRICAL WEST
Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © July, 1947

Action on Ironers

Whatever is was before the war, the time for action in selling ironers is NOW. The difficulty women still have in getting household help has made them all wish for an ironer. Women who own and use one are numerous enough now to have talked the rest of womankind into the idea of owning one. There is no trade-in problem yet. It's a high unit sale. Supply of them is improving. All this means **action** for you—

Action demonstrations are the first step



Ironers bring Benefits — Tell what

Anyone who will take a little trouble to learn how to sell ironers can make real money selling them. So said a prominent manufacturer's representative, handling a big nationally known line of both washers and ironers. He spoke from real personal experience. He believes that the ironer offers a dealer the best sales opportunity in today's market. Why?

First, saturation is still very light; only from 7 to 12% of electric customers own an ironer as yet. This means hundreds of possible customers for any live dealer or salesman.

Second, ironers are now accepted, The old resistance to sales is disappearing. Women wished so hard for the help an ironer could have given them during the trying war times that they should be easy to sell now. They can't get help now any easier than during those days.

Third, there's no trade-in needed. It means a sale that can earn its full retail margin. The unit price is enough to make it worth while to do some demonstrating and selling.

But ironers don't often just sell themselves. Putting one on the floor to sit there, inactive, won't attract much attention. Action always attracts attention. A live demonstration is the best prospect getter anyone can use. It always stops people. It also serves to teach. Those who watch soon get the hang of it and want to try it themselves.

Give them the "feel of the wheel," as the automobile salesmen used to do. Invite them to sit down and try it. Let them try something simple. Let them feel the relaxation of sitting down. (If they have been walking around shopping they welcome a chance to rest.) Tactfully call that idea of rest and relaxation to their attention. That hits home. Let it sink in and be remembered. "Isn't that better than standing up for hours to iron?" ask them.

Then ask questions to learn what they do about ironing, how much of it they have. Suggest that it might be a saving if they could do more of it at home, rather than sending it out, since with an ironer it could be done so much more easily.

First learn to use the ironer yourself then

they are and make More Sales

After you find out what a woman's main interest in an ironer is, then, from the following list of benefits and advantages, assure her that the ironer will accomplish what she needs or wants.

Saves time—An electric ironer will do flat work in about a third of the time. It will do most other wearing apparel in from a half to two-thirds of the time. While no time may be saved on fussy pieces, the ironer will save the energy of the person doing the ironing while doing it.

Saves energy—It makes ironing pleasant and easy. She merely supervises the work, guiding it through the ironer. The actual ironing is done **for** her, instead of **by** her. There is no **lifting** of the iron nor any need to push it or bear down on stubborn wrinkles. Ironing can be done while sitting down in a comfortable chair.

It is cooler—The heat arising from an ironer isn't as close to her as that from an iron. It takes less physical exertion, and hence helps keep one cool.

Saves money—reduces the wear and tear on clothing and flatwork. It is gentle. It doesn't dig in or strain threads. With thermostatic control it won't get so hot as to scorch cloth or damage synthetic fibers like rayon. It is economical to operate. On Western rates it will operate at less than 3c an hour, or 30c a month.

Fewer clothes are needed when the washing and ironing is done at home, and in these days of high prices of clothing this is important.

It is versatile—Besides straight ironing, it can be used to "valet" or press suits, trousers, pleated skirts professionally. Velvets and velours and heavy coats can be steamed successfully. Sweaters, after being washed, can be pressed while still damp and retain their original size and shape. So also with knitted dresses. Can be used to shrink yardage before making it up, in dressmaking, or in pressing seams. Rag rugs can be made to lie flat if starched and ironed. Heat kills moth larvae in woolens.

Does better work—It irons curtains so they hang straighter, polishes linens, etc.

get her to sit down and try it herself

Sell Toward The Complete Laundry

Back in the old days it was quite a feat to sell just the washing machine. But now the washing machine has been glorified and its companions, the electric ironer and now the electric dryer, are being made by manufacturers in matched sets. The home laundry is no longer a dark dive down in a basement or out on an open porch, it is a part of the glamor kitchen or has a streamlined room of its own. And with this trend your opportunity expands for the sale of washer, ironer, dryer, cabinets, laundry accessories.

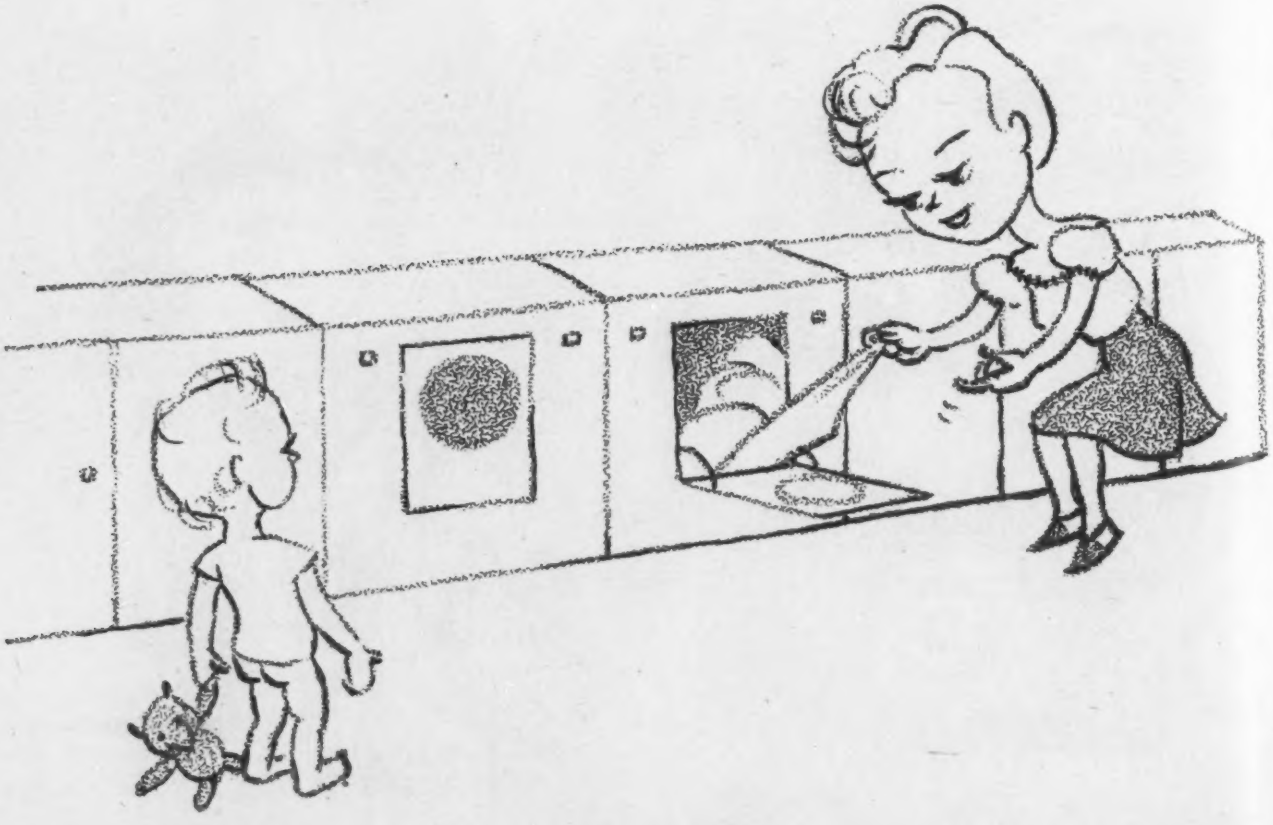
While all of your prospects are not immediate prospects for the complete electric laundry, the sale of any one appliance can be made the starting point for a follow-up to sell the next and next appliance that will ultimately complete the laundry. Just plain good business sense suggests that no washer sale should be left to die on the vine without a follow-up attempt to sell the other appliances.

Dryers, while not new, are just now being developed for more intense selling. They are beautifully designed to match kitchen plans. They are efficient and reasonable in price. What then are the selling appeals to use with the prospect? Here are a few:

Make one independent of the weather—One of the things women have always disliked about doing laundry at home has been the handling of clothes after they are washed, being forced to hang them all around the house inside when the weather is bad; having to rush to get them out when the sun shines, or in when a shower comes along. With a dryer one is independent of the weather and no clothes need be hung around the house.

Heavy hauling and hanging eliminated—Tiring and energy-draining at best, the hanging out of clothes and bringing them in is eliminated. The last disagreeable thing about laundering is wiped out.

Cleaner clothes—Avoids soiling of clean clothes by soot, smoke or mischievous children. Clothes lines are no problem.



UP THERE

ON THE

FOURTH FLOOR

we'll be waiting to show you our new district headquarters and permanent display room. Drop in during the SUMMER MARKET, AUG. 4th through AUG. 9th.

TUNE IN: Ted Malone . . . every morning, Monday through Friday . . . A. B. C. Network

Here's further proof of how Westinghouse is expanding its western facilities.

By the time the Summer Market opens we'll be all ready to greet you in our enlarged quarters in the new addition of the Western Merchandise Mart in San Francisco.

Besides our district headquarters, you will find a beautiful permanent display room completely equipped with the Full Line of Westinghouse Home Appliances. They are staged in the most modern of store settings. It's our famous "Sketch Book" brought to life. You don't want to miss it.

WESTINGHOUSE ELECTRIC CORPORATION
Appliance Division • Mansfield, Ohio
Plants in 25 Cities • Offices Everywhere

Every house needs
Westinghouse
MAKER OF 30 MILLION ELECTRIC HOME APPLIANCES

Dealers Get the Real Low-Down

at San Diego Bureau Conference, June 2, and it's good in any man's territory

Architect Paderewski, Contractor Morse, E. M. Meise and Builder Frank Lockett

ONCE again San Diego's Bureau of Radio and Electrical Appliances packed 'em in the aisles when on Monday, June 2, it presented another of its Annual Spring Conferences at the U. S. Grant Hotel in San Diego, staged by J. Clark Chamberlain.

In attendance were nearly 500 dealers, distributors, salesmen, and manufacturers' representatives, as well as many of the regional sales managers and other leading figures of the electrical appliance industry in the West. Throughout the all-day and evening conference the importance of sales training and the necessity of creative selling became principal themes that were echoed in many of the talks presented.

"We must prepare our organizations for this new selling era," A. E. Holloway, vice-president in charge of sales for the San Diego Gas & Electric Co., told the audience in the opening address of the conference. "Price cutting is not creative selling. Creative selling is establishing the desire of ownership of equipment in the minds where such desire does not exist at present."

In reviewing the tremendous electrical growth of the San Diego territory, Holloway revealed that since VJ-Day his company had connected more than 11,000 new electric customers and 6,000 new gas customers to its distribution system. At the present time some 4,400 electric and 1,700 gas customers have applied for and are waiting for service. Much of the new business is the result of the movement of city people to the country and the purchases and development of small ranches. Nearly 75% of all backlog orders are rural, he stated.

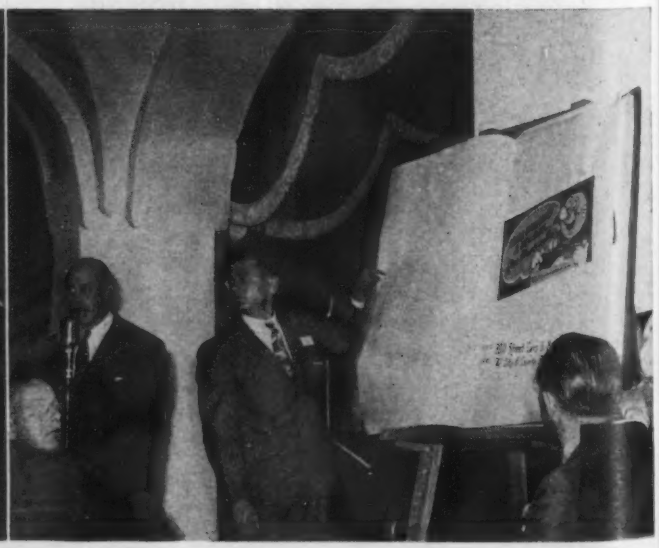
The packaged kitchen offers tremendous opportunities to the electrical appliance dealer in that it enables the dealer to round out his kitchen sales and offer the housewife and home owner every convenience and labor-saving item in the most important room of the house, Larry Coen, sales manager of the American Central Co., Connersville, Ind., told the gathering.

"The modern housewife today has been well educated on the requirements of a kitchen," Coen said. "This has been brought about in recent years by educational programs in practically all of the leading magazines dealing with the home, leading newspapers, local cooking schools, and general publicity. In many respects, the steel sink and cabinet industry has an edge over the refrigeration and appliance industry of 20 years ago.

"Actually, only 5% of all existing kitchens are modern. Therefore, you have a 95% market to deal with. Already more than 29 million wired homes and farms are ripe and ready for kitchen modernization. In this group you have a large unit of sale. In addition, it was predicted a year-and-a-half ago that approximately eight million new homes would be built in the next ten years—and modern kitchens in these homes are a must."

In referring to the necessity of training new salesmen Coen said, "Like

Home freezer manufacturers' panel on afternoon program F. M. Raymond and L. Clapp review bureau's advertising



Electromaster

MEANS PLUS SALES FEATURES

Individual Signal Lights • Automatic Oven-Master Clock • Built-in Minute Master
Safe, convenient and efficient back panel cooking control. Appliance outlet
Vita-Miser Deep Well Cooker • Fast Speed-O-Master Surface Units
Large table-top working area — acid resistant
Big Roomy Warmer Drawer has Signal Light plus Ball Bearing Rollers
Kitchen-Master Oversized Oven, side wall illumination. Fast 2500 W. Belt-high Broiler
Ball Bearing Roller Drawers with Finger-tip control—empty or loaded
Sturdily built of highest quality tested materials with Fiberglas oven insulation

THE BEAUTIFUL BANQUET MODEL

● Sell Electromaster and you sell the finest in electric cooking—because Electromaster ranges are designed and built by *electric range specialists.*

Every feature in the long Electromaster list is time-proved—wanted by practically every person who buys a range.

For 18 years, Electromaster has always been the "bell-ringer of the industry" with range features that sell and stay sold.

And a Low Price Space-Saver

This compact beauty for the small modern kitchen (fits in space two feet square) has sales features galore. Here's big range cooking capacity, complete with the exclusive Vita-Miser deep well cooker, Kitchen-Master oversized oven, and fast Speed-O-Master surface units. It's a fast-moving item on any dealer's floor.

FINEST NAME IN *Electric* COOKING SINCE 1929

Electromaster Inc.

MT. CLEMENS, MICHIGAN

• • •

The Range That's "Fit For A Queen"—on the "Queen For A Day" program—Mutual Network

you, we recognize a most serious condition existing within the profession of salesmen. It has been stated that industry shall require approximately ten million salesmen to cope with the market that is here today and that lies ahead in the future. Today there exist only four million so-called bonafide salesmen. These men, the old-line peddlers, show evidence of lacking what it takes to do the real selling job that is responsible for the success of the major appliance business. It is your duty to back a program in salesmanship to bring about the push that made this major appliance business so successful; and, gentlemen, the push is that finger on the door-bell!"

Two-thirds of the appliance sales in 1948 will be on a credit basis was the prediction by three San Diego bankers and a manufacturers' finance representative in a panel discussion on appliance financing, led by Martin Frazier, vice-president of the Security Bank. Dealers will do well to refuse to accept less than 25% down payment and contracts for more than 24 months on the purchase of major appliances if they wish to avoid repossessions.

B. Roe, R. Swearengin, J. C. Chamberlain, M. Sanders, K. Hampton, A. Marsden

The first four months after a sale is the danger period so far as repossessions are concerned, Harry Gough, regional manager General Electric Contracts Corp., told the meeting. "Keep a close check on your credit sales during that period, and take them back if they begin to slip before it's too late and while the appliance can still be resold in a fairly good condition." Said A. F. Wagele, Bank of America, "Buyers must have equity in their purchases or they are not sound." All agreed that if an appliance is properly sold, the customer's own desire to retain it will prevent repossession from taking place.

Home freezers came in for their share of discussion during the noon, afternoon, and evening sessions. F. M. Raymond, superintendent of advertising for the San Diego Gas & Electric Co., together with O. G. Thompson, chairman of the bureau's advertising committee, reviewed the cooperative advertising financed by the utility to promote dealers' sales of Christmas merchandise, floor and table lamps and vacuum cleaners, as well as to promote the better wiring program for which the bureau is the certifying agency. Also reviewed was the bureau's present campaign to stimulate sales in home freezers.

On this all-out campaign, Raymond told the audience that bureau advertising stressing both the economy and the luxury of the home freezer operation is appearing in newspapers and billboards in the city and county.

The timeliness of this advertising theme became the subject for Ben Sanderson's (regional manager, Deepfreeze) talk during the home freezer panel discussion which followed. "Sell the need, and then sell the product," Sanderson told the audience. "The American public buys the leisure advantages, not the nuts and bolts. Before we can sell many home freezers we must first sell leisure, use, economy."

N. B. Dinkel, West Coast manager for Crosley, reminded the audience that in the early days of refrigeration sales every dealer and a good many salesmen were required to own a refrigerator because ownership prompted enthusiasm. Dealers, he said, should make a point of owning a freezer and putting it in a conspicuous place in the home. Ed Barnes of Kelvinator suggested making connections with meat wholesalers where customers may obtain steaks, game, and other foods which make a home freezer a novelty. A home freezer has an appeal to four types of customers: the luxury customer, who wants to preserve game and out-of-season foods; the saving customer, who wants economy through quantity buying; the canning customers, who preserve food each season; and the customer who finds shopping awkward and can use a home freezer to save on shopping trips, he said.

U. S. Grant of U. S. Grant Supply stated that salesmen would have to overcome the increasing resistance among customers who are postponing the purchase of a freezer until prices drop. "We've got to sell them on the idea that they are getting their money's worth now—a real value today, and there is no reason for postponing or foregoing the luxury of a freezer for several years just to wait for prices that may not come down for some time."

Stoneback of Blake, Moffitt and Towne suggested that dealers could add to their sales volume by carrying packaging items in stock. Dealers who carry these items will perform a genuine service for customers, he said, in addition to providing the dealer with a continuing contact with the customer for years to come.

During the afternoon session E. W. Meise, superintendent of domestic electric sales for the San Diego Gas & Electric Co. and chairman of the bureau's Adequate Wiring Committee, presented the views of an architect, an electrical contractor, and a building trade association manager on the bureau's free service of checking wiring plans on new homes. C. J. Paderewski, architect, termed the service "a definite value" because it was authoritative to architects. Said Jack Morse, "Such a service means much to the new home owner because it will save additional wiring costs later on." Frank Lockett, manager of the Home Planners' Institute of San Diego County, an association organized for the purpose of providing prospective home builders with authentic information concerning new homes, stated that two of the largest building contractors in San Diego are equipping their homes with adequate wiring because it adds to the sales value of the homes.

Despite its location at the tail end of the afternoon session, the manufacturers' panel held a capacity audience in the Gold Room of the hotel. Thirty-two manufacturers' representatives, sales managers, and other Pacific Coast officials of the industry gave four-minute impromptu talks on production activity at the home factory, deliveries, and brand new products appearing soon on the market.

Burt Dorris, Stromberg Carlson, warned dealers against overselling FM for fear of disappointing the public and creating a resistance which might

only Monarch ELECTRIC

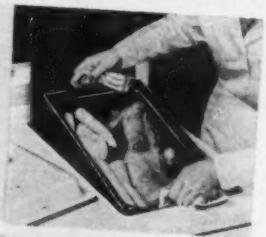
an tell this ➡
OASTER RANGE STORY

ok over the electric range field. hat is today's most exciting es feature with the most prac- al appeal to homemakers? You but one answer: Monarch's Oven Roaster Range!

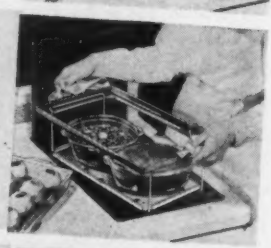
ore than anything else, women nt plenty of oven space, and re's the range that gives it to em — without sacrificing wers for storage. On radio d in magazines, Monarch ad- tising is telling this powerful oven story to the nation's nemakers.

YES, that's right . . .
Two Ovens!

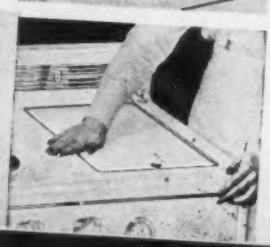
MONARCH'S ELECTRIC ROASTER RANGE



Perfect for vegetable dinners, baked beans, sauerkraut and spareribs, soups, biscuits, quick cakes, etc.



Convenient lifter rack for casserole and other baked dishes. Ample capacity for complete meals.



When closed, the porcelain enamel lid is flush with cooking top — absolutely no obstruction.

HOW often you've wished for ENOUGH oven space! Here you have it! In addition to the regular full-size oven — this beautiful Monarch Electric Range has a roaster-size oven built into the cooking top. . . . a new, exclusive convenience which saves electricity, saves time, saves stooping. Lift the cover and there's your food! Makes a perfect Steam-Table-Server for keeping second servings juicy and hot. This range is also equipped with Monarch's exclusive "Deep Heet" Double Boiler Sauce Pan. See this exciting new range at your nearest Monarch dealer.

Monarch ELECTRIC

MALLEABLE IRON RANGE CO.
3977 Lake Street Beaver Dam, Wis.

As featured in:
Ladies' Home Journal—July; *Better Homes & Gardens*—Aug.

later prove an obstacle to FM sales. Dealers would do well to concentrate on selling the features of modern radio combinations with emphasis on the advantages to be enjoyed from the vast library of recorded music now available.

Ray Hahn, Maytag, reported good production of washers despite critical shortages of materials. Home freezers and dutch oven production have started, he said. Dick Page, Thermador, also reported good deliveries and announced that his firm is now producing built-in ranges for homes. The ranges, he said, are shipped as packaged units and can be assembled to make a complete custom-built job.

Charley P. Culbert, Proctor, stated that deliveries are far ahead of prewar levels. His firm is planning public demonstrations of ironers to convince the housewife of the idea that shirts can be easily ironed in 4½ minutes. Hank Marsh, Easy Washer, announced that Easy is coming out with a brand new spinner type washer. Meantime, he said, production on portable washers is underway. L. P. Shelley, Rise-'N-Shine Co., San Diego, announced that his company is offering on the market, for the first time, a night light which goes on automatically when one gets out of bed during the night.

George Williams of Maryon Williams Co. reported that the Conlon ironer production of his factory is being absorbed so fast that washer production has not yet started. San Diego County, he said, has a 17% saturation with ironers, compared to a national average of 10%. One of the dealer's biggest markets today is ironers, he predicted. Sewing machines are better than 100% of prewar production, L. A. Peterson, district sales manager for the New Home Sewing Machine Co., told the audience. Paul Bradner, Westinghouse, stated that traffic appliance production has been tremendously stepped up; featured among these is a new Westinghouse electric comforter.

Howard Oliphant, General Electric, stated that his company now has ranges with Calrod units that are faster than fire, has triple ovens and built-in pressure cookers, the units of which may be raised to make a fourth burner when the pressure cooker is not in use. The Calrod units are being built into water heaters, too, he stated. Fred Kassler, Gough Industries, explained the new garbage disposer unit which his firm is featuring, promoting a new completely automatic garbage disposer.

Other speakers appearing on the panel were: J. Ross Sims of Hurley Machine; Ken Campbell, regional manager of Toastmaster; George E. Newlin, regional manager, General Mills;

Lou D. Stull, Apex, was one of the evening sales panel with five-minute talks

C. V. "Buzz" Koch and Clarence Pagel.

Following the evening banquet in the Rose Room, Ken Hampton, manager of the Valley Electrical Supply Co., Fresno, said that the best advertised depression known had failed to materialize, and there was normalcy ahead. "But," he added, "if you want to do a profitable business in the years to come you are going to have to increase your sales expenses, and by that I mean sales promotion, advertising, sales training, and salesmen's pay." To do this effectively dealers must keep a record of business and be able to tell from day to day whether or not they are operating at a profit or a loss.

He urged dealers to enforce normal credit terms and arrange for satisfactory credit through loan organizations, to check accounts receivable, and get rid of any dead wood. Dealers can also curtail expenses by cutting out the few long profit-slow sale items. "Make the manufacturers prove the value of brand names before you carry the merchandise," he advised. Considerable savings may be realized by carrying through on claims for damaged merchandise, checking the wastage of paper and string, and by keeping well informed on taxes in order to take advantage of all possible deductions.

In the evening panel discussion by six top industry executives, Ben Tassie, General Electric Co., told the audience that "competitive salesmanship has made this the greatest nation in the world."

Before the war America had 17 million salesmen, of which 7% were bona-fide salesmen," said Ben T. Roe of the J. N. Ceazan Co. "Keep those home freezers in your store filled with food," H. E. Sherman told the audience. Other speakers who appeared were Lou D. Stull, Western regional manager of Apex, and V. E. Koch.

In a talk on the Home Freezer Market and the best sales approach to this undeveloped field, Roger B. Trick, manager of home freezer sales, Kelvinator, Detroit, Mich., stated that about 3% of the fresh foods consumed is frozen food." As of the first of this year there were approximately 300,000 home freezers in use nationally. In other words, about one per cent of the wired homes in America have home freezers. Another great impetus has been the locker plants, which have grown from 250 in 1935 to 8,000, with over 3,000,000 individual lockers today. Seventy-five per cent of the users are farmers.

"As the locker plant and frozen food business has expanded, home freezers are being well publicized. The locker plant has pre-sold many thousands of people on the quality of frozen foods vs. the old method of canning, or preserving through other means. Those of you who handle the farm trade will find that locker renters are excellent prospects for home freezers. Most locker plants have recognized this and are encouraging the sale of home freezers because it means more business for them from a processing angle. Our studies indicate that few farmers will release their lockers when they buy a freezer for their own homes."

Trick likened the present sales potential of the home freezer to that of the electric refrigerator in 1925. Because few people, including dealers and salesmen, really understood a refrigerator or what it would do for them, manufacturers, distributors, and retailers used the refrigerator in their own homes and in that manner became acquainted with its advantages. "Therefore, I recommend that all of us who wish to sell home freezers successfully

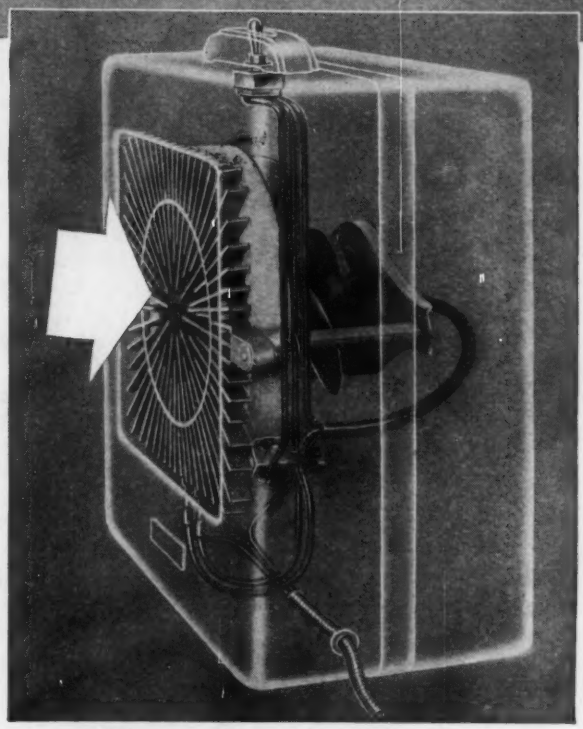
THE HEATER SENSATION OF THE YEAR!

ELECTROMODE

WITH THE EXCLUSIVE, PATENTED SAFETY-GRID

NO wonder buyers everywhere are choosing Electromodes—the only heaters on the market with the Safety-Grid—the exclusive, patented cast-aluminum heating element that has no exposed hot wires or glowing coils . . . that won't, *can't* cause fire, shock or burn!

Here is the greatest selling feature an all-electric heater ever had . . . *and only Electromode* has it! Dealers and wholesalers all over the country are cashing in on this quality-built line of all-electric heaters. Join the profit parade. Sell Electromode.



X-Ray view of Electromode Portable Heater shows the exclusive cast-aluminum Safety-Grid.

A COMPLETE LINE OF HEATERS OFFERING YOU *GREATER SALES AND PROFITS!*

PORTABLE ROOM HEATER. A sturdy "quality" heater that's completely safe for children. Combines lightness with compactness. Plugs in anywhere.

BILT-IN-WALL SMALL-ROOM HEATER. Easily installed in bath or any small room; requires no special wiring.

BILT-IN-WALL ROOM HEATER for homes or offices. Employs unique Down-Flo principle of warm air delivery. Manual or thermostatic control.

PORTABLE ROOM HEATER for home and office. Gives high BTU output; circulates warmth by Down-Flo principle.

STANDARD UNIT HEATER for industrial use. One of a complete line of Electromode standard and specialized industrial unit heaters.

A GREAT PROMOTION PROGRAM!

We back you 100% with a big, soundly-planned advertising campaign—Electromode Domestic Heater ads month after month in leading magazines . . . consistent Industrial Heater advertising in top business papers. And a complete, up-to-date array of sales promotion aids! Write Electromode Corporation, Dept. EW-77, for complete information.

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THE *Proved and Approved* METHOD
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Ideal "Wire-Nuts" are rapidly replacing old-fashiond methods wherever wire connections are made. Millions are being used in new construction, remodeling and re-wiring . . . in repair work . . . in the manufacture of electrical goods . . . and in the installation and maintenance of electrical equipment. *Effect real savings.* "Wire-Nuts" are made in sizes for all usual wire combinations. Factory tested and inspected. *Reduced prices now in effect.* Order from your Electrical Wholesaler today!

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Bryant Electric Co.	"Bryant"
Solar Electric Corp.	"Scru-Its"
Weiss & Biheller, Inc.	"Simplex" and "Coaxx"

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first make sure we have freezers in our own homes so we can know from actual experience what we are talking about. You cannot depend upon advertising or sales promotion material entirely to take the place of the spoken word. To do the most effective job, you should be in a position to relate many of the varied uses to which your home freezer is put. It will be necessary to cultivate a group of enthusiastic users by calling back on them frequently. Not long ago we compiled for a survey a total of 91 different home freezer uses. Everyone who has seen this list has had his eyes opened when confronted with all the advantages a home freezer offers."

Edmund T. Price, president of the Solar Aircraft Co. of both San Diego and Des Moines, Iowa, as well as president of the San Diego Chamber of Commerce, predicted that by 1950 San Diego appliance dealers would have a market of nearly one million persons located in this area. Price reminded the audience that ever since 1870 San Diego's population has doubled every ten years. In support of his prediction he pointed to the tremendous growth of San Diego's back country area, the fact that its climate has made the area not only a mecca for tourists, but is largely responsible for the fact that San Diego today ranks 23rd in the nation for the richness of its agricultural products. He pointed to the growing importance of San Diego's harbor in the eyes of the Navy, as well as the fact that the tuna industry here has become a major industry.

In referring to the vast undeveloped territory of Baja California, he said "Over the next 25 years this new frontier should mean that San Diego is the natural shipping and distributing point for the existing as well as the new towns and cities to be created. This is a situation unmatched by any other community in the country, because none, to my knowledge, is situated on the threshold of a new frontier, waiting to be developed by men of vision."

In the concluding talk of the evening, *Eve Didn't Buy a Red Apple,* Milton Sanders, vice-president of the Central-Arizona Light and Power Co., stressed the importance of sales training for dealers in the days ahead. The art of selling is as old as Eve, said Sanders, while quoting a passage from the first chapter of the Bible. "Even in those days the serpent who sold Eve on eating the apple did so because he was smart enough to show her what the apple would do for her. We're going to have to get back to those same old-fashioned principles if we're going to reap the harvests of the great markets of the future."

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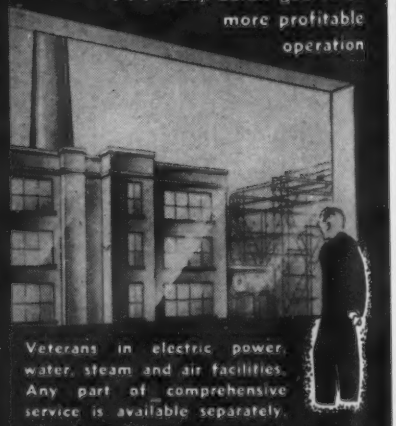

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When it comes to lamps using the new circular fluorescent tube, don't overlook the vital necessity of good ballast equipment . . . CERTIFIED BALLASTS!

Proper installation of CERTIFIED BALLASTS avoids excessive heat, which causes injury to floor coverings and table tops. They are free from noise . . . assure longer fluorescent tube life and maximum light from the lamps.

"CERTIFIED" on a ballast means that it has been tested, checked and CERTIFIED by famous Electrical Testing Laboratories, Inc. as having met exacting specifications for satisfactory operation and performance. Make sure the fluorescent portable lamp you select uses a ballast with the ETL CERTIFIED shield! They're your best assurance of customer acceptance and good will.

CERTIFIED E·T·L SPEC. NO. 6

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General Electric Co.
Specialty Transformer Division
Fort Wayne, Ind.

Jefferson Electric Co.
Bellwood, Illinois

Sola Electric Co.
2525 Clybourn Avenue
Chicago 14, Illinois

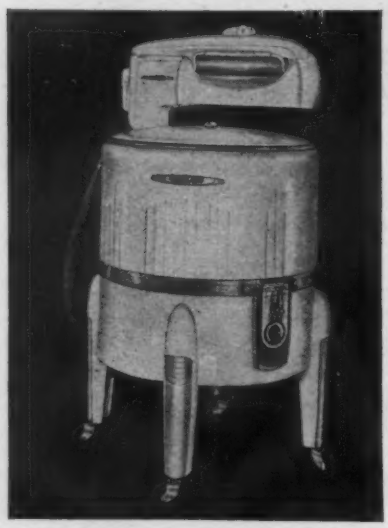
Starring and Company
Bridgeport, Conn.

Wheeler Insulated Wire Co., 378 Washington Ave., Bridgeport, Conn.

APPLIANCE PREVIEW

Washer (723)

Landers, Frary & Clark's new Universal washer has two speeds, low for fine materials and high for heavy pieces. A control panel at the base of the bullet type fluted tub contains speed selector, washing timer and safety switch which cuts off operation in case of overload or stalled motor. The Universal-Lovall wringer has a patented pull stop control for both rolls and it is claimed that a light tug upon the clothes will stop the rolls instantly. The wringer will lock automatically in five positions; has a pressure selector.



Toaster (724)

Westinghouse has announced a new model TT-72 turnover toaster in tarnish-proof chrome. It toasts two slices, automatically turns them when the trays are lowered. Operates on 115 volts a-c or d-c, has 450-watt heating element.

Oven (725)

The new Proctor Roast-Or-Grille, Model 122, is a thermostatically controlled portable electric oven with a broiler in the lid. It comes in baked white enamel and chromium with grey acid-resisting inset pan and three-piece black enamel pan set. Capacity is 18 qt. liquid measure; will take a 20 lb. turkey. The 1,500-watt broiler operates on a-c and d-c and can be inserted or removed from the lid with one hand. Oven is 1,320 watts, 110-120 volts, a-c. Roaster lid is self-basting and broiler self-cleaning.

Heater (726)

Nesco's new portable electric heater is of aluminum construction, operates on a two-way "radiation-convection" principle said to reach effective heating capacity in less than 90 seconds. This heater has a safety grill, 6-ft. permanently attached cord, uses 1,250 watts, operates on 110-120 a-c or d-c, is approved by Underwriters' Laboratories.

Two-Temp Refrigerator (727)

A 7-cu. ft. Two-Temperature refrigerator that will hold 56 lb. of frozen food in the freeze chest and ice storage tray has been announced by Westinghouse Electric Corp. The freeze chest has a rated capacity of 1¼ cu. ft. or 43 lb. of frozen food storage, and the ice storage tray immediately under the freeze chest is rated at four-tenths of a cubic foot, or 13 lb. of frozen food. The freeze chest is refrigerated on the top, bottom, sides and back, and can be used for a limited amount of freezing as well as for its primary job of frozen food storage.

A manual temperature selector controls the temperature of the freeze chest, and a second automatic control regulates the temperature of the general food storage area.

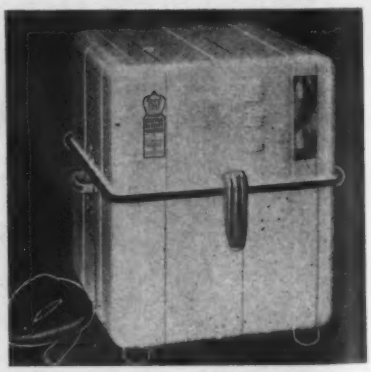
Dimensions of the new model MF-7-47 are 30¼ in. wide, 57⅝ in. high, and 25¾ in. deep. Equipment supplied with the model includes two 14-cube "Select-O-Cube" ice trays, two specially designed 14-cube trays that make it possible to remove one cube at a time, and two vegetable crisper containers, called Humidrawers, with a total capacity of one-half bushel of fruits and vegetables. Covers are ring-proof ribbed glass. Main food compartment arrangements are flexible, so that large items can be stored.

Table-Top Water Heater (728)

A 40-gal. automatic table-top water heater with 4 sq. ft. of acid-resisting porcelain enameled work surface is offered by Westinghouse. The unit can replace a 24-in. base cabinet. It has a thermostat with an adjustment range of 120° to 170°; an immersion type heating element; Fiberglas insulation; a scientifically designed cold-water baffle. The galvanized copper bearing steel tank is tested to withstand 350 lb. pressure. Standard 230-240 volt heating element, 2,000 watts.

Small Washer (729)

A small portable electric washing machine, the Royal Chef, has been put into production by Poulsen & Nardon and is expected to be on the market in the fall. It is of heavy-gage aluminum with baked white enamel finish and stands 19¾ in. high, has a 15⅞-in. side width and a 15⅞-in. front width; weighs 20 lb. It uses a rotary drum washing principle, is claimed to wash up to 4½ lb. of clothes in from 10 to 12 min. It is equipped with a drain and the washing drum has two loading compartments.



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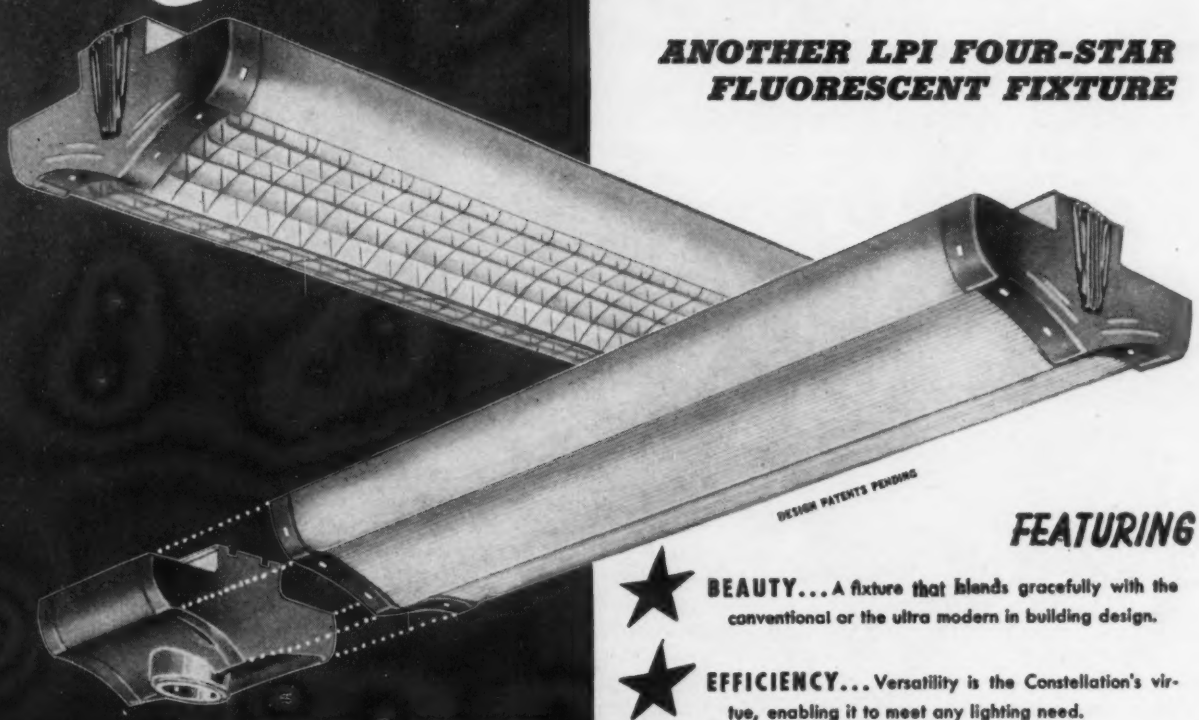

The Attractive Spot-o-Lite unit can be added to single units or continuous runs for impressive accent lighting.

FEATURING

- **BEAUTY...** A fixture that blends gracefully with the conventional or the ultra modern in building design.
- **EFFICIENCY...** Versatility is the Constellation's virtue, enabling it to meet any lighting need.
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- **EASY MAINTENANCE...** Expert engineering and design mean long life and low-cost Easy Maintenance.

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LIGHTING PRODUCTS, INC.

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THE MONTH IN BRIEF

Fuel for Russia

With power companies in California using oil at the rate of 15,000,000 bbl. per year with projected requirements double that figure and prospects of filling bleak, news that Russian tankers would take almost 1,000,000 bbl. from southern California to Siberia in June caused no little consternation. Pacific Northwest utilities were told just recently by the oil people that their requirements (at most only three times the June Russian take) could not be fully met.

PUD Possibilities

Scheduled for November completion is a 1,200-mile natural gas pipeline costing $75,000,000 from Texas to southern California. It will help the tight fuel situation in that region. Assured success of the line has stimulated interest in an oil pipeline from either Texas or Wyoming to meet the growing California deficit between production and use.

Fuel for California

Now that the Washington State Supreme Court has declared the $135,000,000 Skagit PUD takeover of Puget Sound Power & Light to be illegal there is considerable speculation as to the next step in the involved power picture in western Washington. Some are predicting optimistically that the decision will put the quietus on public power activities for a time. Possible alternatives include: (1) piecemeal takeover by the PUDs involved—not considered likely because of the high severance damages included in condemnation prices; (2) formation of a state-wide cooperative similar to the one in Nebraska—also unlikely because of an estimated $15,000,000 higher price in such a case; (3) amendment of present laws to permit a renewal of the Skagit takeover—considered unlikely because of the time required and the uncertainty of passage.

Souping Up Vegetables

University of California's department of agricultural engineering will soon begin experiments on ultra short wave electronic applications to various agricultural fields under the sponsorship of the CREA. Interest has been stimulated by reports of Russian success in microwave treatment of various seeds to increase production. Cotton yield was raised 17%, various vegetables 70-80% and potato production 100%. Melon and sunflower yields also went up after exposure of seeds. German invasion of the Ukraine where most of the acreage was planted interrupted the experiments which are now being resumed.

The Mighty Pen Pricks BPA

Oregon newspaper editors have been having an editorial field day with the news that scores of special "consultants" have been on the Bonneville Power Administration pay roll at various per diem rates ranging from $10 to $50. Particularly harsh has been criticism of the master of the Oregon State Grange, Morton Tompkins, and of a fellow newspaper editor. Data on the consultants came out during Congressional hearings on BPA appropriations.

Hollywood Rival

Staunch advocates of the motion picture as a means of educating and entertaining customers and public, Pacific Gas and Electric Co. adds new laurels to its record of high-class films with a new color picture on farm electrification. PG and E Photographer Jon Frederic Stanton required 18 months to shoot the 16,000 ft. of film from which 3,500 ft. were finally selected. Script was written by the company's publicity department. Those who have previewed the film rate it as one of the finest examples of color photography thus far produced.

Yes, They Heat the Bananas

There's a firm in Phoenix that's using both ends of the refrigeration cycle at the same time. Heat taken from their vegetable cold storage rooms is pumped over to maintain warmth in a banana ripening locker.

Power for Arizona

By 1950, Central Arizona L&P will have its steam plant capacity up to 102,000 kw. if deliveries come through on schedule. The system has just ordered another 30,000-kw. unit, in addition to one being installed now.

Electricians Wages Rise

Led off by Fresno some months ago the scales for electrical workers of IBEW unions has been advanced again in most all California and many Northwest cities from $2 an hour for journeymen to either $2.15 with another 10 cents agreed on starting in October, or to a straight $2.25. In some areas this represents a 28.5% increase since 1940.

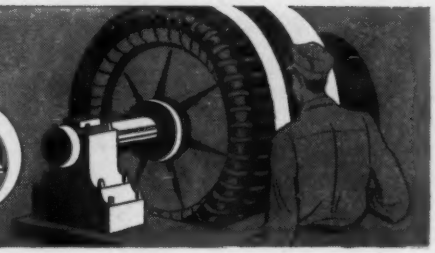
Home Show in Los Angeles

Selling is not a lost art. Anyone who visited the big Construction Industries Exposition and Home Show at Pan-Pacific Auditorium in Los Angeles (and 10,000 people every day did), found the old "pitch" going strong. Again electrical appliances and appurtenances for home and for construction, dominated the show.

Heating Controversy Gets Hot

Various methods have been proposed for temporary control over all-electric residential heating installations but Seattle City Light's suggested increased rate has aroused opposition. Seattle is considering an electric heating rate of 1.8 cents per kwh. for all energy in excess of 1,200 kwh. monthly, instead of the 7-mill bottom step in the present all-electric home rate. The Electric Heating Association in voicing opposition to the proposal, contends that the new rate is an unwarranted penalty on present heating customers.

STANDARD ENGINEERS NOTEBOOK



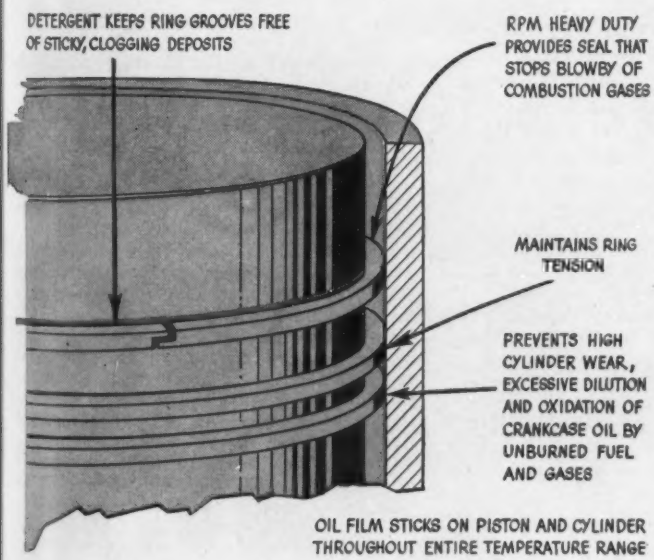
Heavy-duty motor oil reduces cylinder wear

Many operators have eliminated stuck rings, blow-by and excessive cylinder wear by using RPM Heavy Duty Motor Oil.

This special heavy duty oil contains patented additives which remove sticky gum, carbon and lacquer from rings and ring grooves, keeping rings free so they can expand fully. With rings expanded, the tough lubricant film of RPM Heavy Duty Motor Oil forms a seal between rings and cylinder which prevents the force of combustion from driving gases and fuels down the walls.

RPM Heavy Duty Motor Oil sticks to metal at all operating temperatures. This assures unsurpassed lubrication at all times on surfaces of cylinders, pistons and rings, reducing wear to a minimum.

RPM Heavy Duty Motor Oil will resist sludge formation even in coldest operations, will not foam or corrode bearing metals.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RPM HEAVY DUTY PROVIDES SEAL THAT STOPS BLOWBY OF COMBUSTION GASES
MAINTAINS RING TENSION
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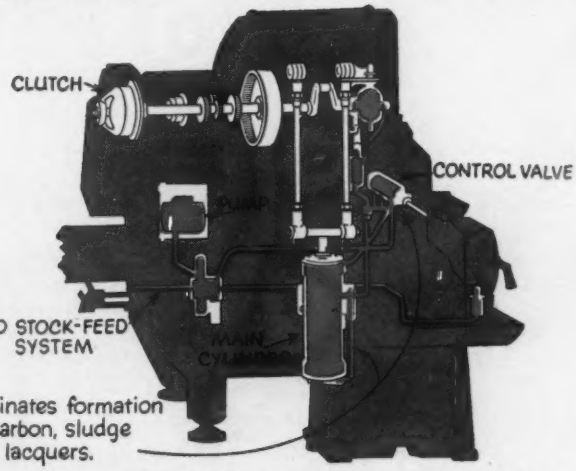
OIL FILM STICKS ON PISTON AND CYLINDER THROUGHOUT ENTIRE TEMPERATURE RANGE

Calol O-C Turbine Oil is highly refined — almost water white.

Contains both corrosion and oxidation inhibitors.



Hydraulic Saw-Feed System on Metal-Cutting Saw.

Inhibited oil stops hydraulic system clogging

The formation of rust, gum and lacquer on cylinders, pistons and valves in hydraulic systems on machine tools may be eliminated by specifying Calol O-C Turbine Oil as the hydraulic medium.

This specially made oil contains both corrosion and oxidation inhibitors. Its resistance to deterioration from oxidation is so great that it is rarely necessary to replace original charges in hydraulic units when contaminants are properly excluded—only oil actually lost need be replaced.

Calol O-C Turbine Oil is also widely used in steam turbines by operators who require the finest turbine oil available. It assures protection against rust in initial operation as well as throughout the life of the oil-charge.

Calol O-C Turbine Oil will withstand high operating temperatures and pressures, and is highly moisture-resistant. Comes in four viscosity grades: 9, 11, 15 and 19.

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THIS MONTH'S NEWS

WASHINGTON PUD DEAL DECLARED ILLEGAL

Proposed purchase of Puget Sound Power & Light Co. by Skagit County PUD acting for 18 districts was declared illegal in a 5 to 4 decision handed down by the Washington State Supreme Court on June 16. The case was filed with the state supreme court May 26, 1946, as an appeal from a test-cast decision in the Skagit County Superior Court.

Bitter dissension among the justices was followed by a statement from Chief Justice Joseph A. Mallory and four other judges severely criticising Justice William J. Millard for alleged eleventh-hour reversal of opinion and dilatory tactics in final affirmation of the majority opinion. Justice Millard issued a rejoiner that the chief justice was acting politically and was violating long-standing court procedure in revealing inner court workings and tentative opinions of judges.

The majority opinion was written by Justice Matthew W. Hill, with Justices Millard, Steinert, Simpson and Schwellenbach concurring.

In finding the proposal unconstitutional, Judge Hill pointed out that a municipal corporation is prohibited from becoming directly or indirectly the owner of any stock in or bonds of any association, company or corporation; stated that a public utility district is universally regarded in existing law as a municipal corporation. Under the purchase plan, Puget Power stockholders would trade in their stock at $18 per share and the Skagit PUD, as issuer of the $135,000,000 in bonds to cover the purchase, would be owner of the stock.

The majority opinion also takes issue with the PUD interpretation of the legislative provision for PUDs to purchase property "within and without" their respective districts. It holds that it was the intention of the legislature to permit only purchase of property incidental to providing the inhabitants of PUDs with public power service and not to authorize the purchase of a far-flung system.

The opinion states that, while the Skagit PUD and its representatives emphasized that all the electric properties of Puget Sound must be acquired because it is an integrated system, they also testified that the purpose of the purchase was to redistribute the system to each individual district. "To carry the respondents' arguments to its logical conclusion," the opinion stated, "means that the Skagit PUD could acquire not only the properties of Puget Sound company but it could acquire those of the Washington Water Power Co. and the Pacific Power & Light Co. serving the great industrial, mining and agricultural areas of eastern Washington." It was not the intention of the legislature to legalize or authorize such purchases in the opinion of the court.

It was pointed out that Skagit PUD has approximately 5% of the power consumption of the Puget Power system; under the proposed plan would furnish power at wholesale to districts having six times as many customers and using six times as much power.

The decision will become final within 30 days of its filing unless a petition for rehearing is filed. Within three months after the decision becomes final, an application may be made for review by the U. S. Supreme Court.

That the PUDs are considering other plans to acquire the system was evidenced in statements by Guy C. Myers, PUD fiscal agent, and Bert L. Heggen, Skagit PUD president. While no definite plan was announced, there was discussion of a state-wide cooperative to buy the private system and redistribute it to individual PUDs.

Frank McLaughlin, president of Puget Sound Power & Light, in a letter to stockholders said:

"If this decision becomes final, it will nullify the existing purchase proposal but it does not preclude the possibility of other plans for the over-all acquisition of the properties of the company at a fair price. In the absence of the elimination of subsidized public power competition, which is seemingly most difficult to accomplish, the people should in all fairness see to it that stockholders are afforded an opportunity to sell their property at a fair price. Private capital should not be confiscated by unfair government competition. When a company is not permitted to effectively and efficiently function because of unfair competition established by government, as in the case with Puget, there results serious consequences to stockholders, employees and customers alike. This is particularly true in the state of Washington, where the welfare of the individual and the economy of the state are to a large extent dependent on an adequate supply of cheap power. Piecemeal condemnation of large integrated systems and duplication of existing facilities by government agencies are against the public interest but they are the alternatives to a sale of the property which confronts the company. The only way the inherent advantages and economies of a large interconnected system can be preserved is by an over-all acquisition."

● San Diego Gas & Electric Co.'s employee magazine, *News Meter*, won first place in the 1947 Red Cross Fund Campaign cover contest for company publications.

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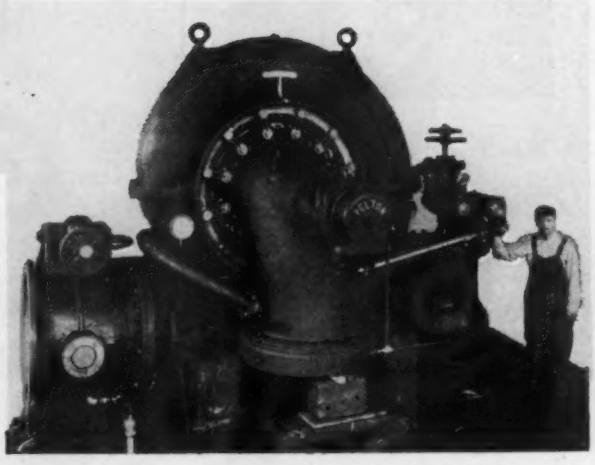

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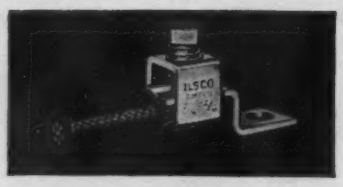

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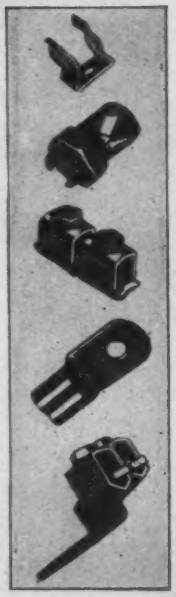

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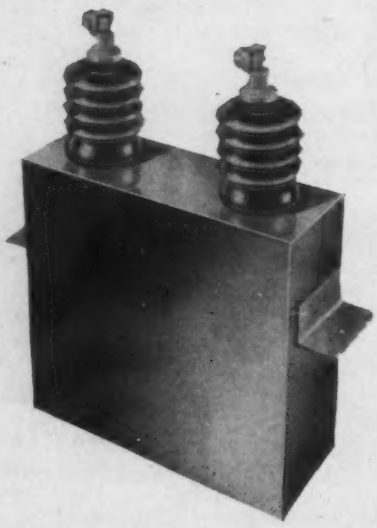

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NEW MEXICO PUBLIC SERVICE GIVEN 25-YEAR FRANCHISE

The Albuquerque, N. Mex., City Commission has approved a 25-year electric franchise for the Public Service Co. of New Mexico. Under New Mexico law, the commission action is final, with no election needed.

The franchise, effective July 1, provides for payment to the city of a 2% tax on gross receipts from electric sales. A separate agreement makes the tax payment retroactive to April 1, and applies the levy to natural gas sales.

The 2% tax on electric receipts is expected to result in about $50,000 annually for the city. The old franchise did not provide for payment of any such levy.

The franchise, which had been under consideration by the city commission for three weeks, was asked by Arthur Prager, president, who had stated money for needed expansion would be dependent upon renewal of the franchise, since the old one would have expired in July. The company recently requested approval from both the Security Exchange Commission and the New Mexico Public Service Commission for $6,800,000 of 30-year first mortgage bonds and 20,000 shares of $100 par cumulative preferred stock to be sold through competitive bidding. It also has applied for authority to increase authorized capital stock from $5,250,000 to $10,000,000.

The new Albuquerque electric franchise carries a provision that if the city succeeds in acquiring the utility, the franchise value shall be exactly $1.

Jury Puts Valuation on Pacific Power Properties

Valuation of $1,200,000 was placed on Franklin County (Wash.) holdings of Pacific Power & Light Co. by a superior court jury. PUD estimates of market value plus severance value were as low as $643,000; company estimates ranged from $1,400,000 to $1,600,000. The PUD will have a year to decide whether or not to buy.

● OREGON State Hydroelectric Commission has taken under advisement a proposal to create a PUD in eastern Polk County in the Willamette Valley. At an election last February rural areas in the proposed PUD voted more than two to one in favor of the project, while the city of Independence voted against it by a narrow margin. The commission is now being asked to approve formation of a PUD which includes only the rural areas.

WORLD LEADERSHIP...

Our Duty and Our Opportunity

CAPITALISM in Europe and the rest of the world is challenged by a real and formidable rival, communism. For capitalism to thrive a reasonable amount of prosperity is essential. Communism uses poverty to advance itself.

Except for the Western Hemisphere, most of the world came out of the war poor. Two years after V-E Day it is still poor. It needs dollars. It needs credit. It needs capital. It needs trade. It needs technical and managerial skills.

If we in America are to help the rest of the world back to its feet, starting it again on the road to peace and a free economy, we should try to supply those needs within the limits of our capacity.

We must not overtax our own strength. For the first requirement of a stable world is a strong United States. But we must accept leadership in international economic recovery—in our own self-interest.

What can the United States do to help men back to prosperity in a world economy which will allow them *freedom and incentive?* There are many things. But here are two of the most important:

1. The United States, through Congress, must determine the pattern and the total of the foreign loans or grants it can afford. We must answer three questions. How much will the new program cost? Can we afford it? Have we the technicians and managers to watch the loans, assuring their fruitful use?
2. We must demonstrate that we do not intend to raise our tariff walls to prohibitive heights when our debtors begin to repay us in goods and services, which is the only practical way they can pay us. Otherwise our loans will become losses.

If the United States is to meet even the minimum requirements of world rehabilitation, Congress eventually must authorize more advances than those to Greece and Turkey. The $400 million for those two countries will not do the over-all job of political and economic defense which we have begun. A minimum of $5 billion, if promptly and wisely applied in eight to ten countries, might suffice. BUT this $5 billion will be on top of approximately $16.8 billion which we have spent or earmarked during the past two years for use abroad, including our full share of the World Bank and Fund. We shall do a faster and more effective job if Congress will thus add up the foreseeable total of our international aid, and, even though the total looks imposingly large, commit us to it, with proper collateral safeguards from the debtor nations.

Congress need not try to foretell all contingencies, like last winter's weather in Britain, and it certainly should not create the impression that nations need only ask for billions to receive them. On the other hand, the war should have taught us the miserable consequences of "too little and too late." The President should have learned that he engenders skepticism by going to Congress with parts of a program, as he has done in the British, Grecian and Turkish loans. Within the limits of our capacity, we must make the decision now to see the whole job through—or throw in the sponge.

In the interest of the debtor nations—as well as in our own interest—the loan program should be hard-boiled. Rehabilitation loans must really rehabilitate. They must produce a state of economic health which will permit the World Bank and private capital to take over the task of financing world recovery—as perhaps can be done today in France and the Low Countries.

The loans, therefore, must be within the limits of our technical and managerial ability to implement them. Without technical help, Greece can not use its loan effectively—to rebuild railroads, clear ports, revive agriculture. Without skilled supervisors, Germany can not be made to pay its way. Money alone won't pull China from the brink of economic chaos.

Our lending calls for more than money. It calls for trained personnel to help the recipients utilize the loans effectively—geologists, construction and sanitary engineers, monetary experts, and management and agricultural specialists.

Loans are necessary but they are only a first step. A long-range program requires the opening of the half-closed doors of world trade—our own door, too.

We will have to get used to the idea that, when our debtors pay us, they must pay us largely in goods and services. Refusal to permit such repayments in the twenties helped start the world depression in the thirties—and the loss of our investments. *Imports do tend to raise living standards, and a two-way trade program need not require us to slash our present tariff rates.*

The complexion of our foreign trade has changed since the war. Our manufacturing capacity has increased and our raw-material self-sufficiency is tending to decline. For example, we probably shall have to continue importing copper and zinc and to increase our prewar dependence on imported lead. We may soon have to depend heavily on imported oil, and—gradually—on a growing volume of iron ore from abroad. Our normal dependence on imports for commodities like rubber, tin and silk will continue.

Our population has gone up 10 million in the last decade, and we now have a $176 billion national income, making room for more imports.

As a result of every nation's recent attempts to make itself secure and self-sufficient by slamming its trade door, a world-wide series of quotas and restrictions is blocking international trade. Even more, government buying and selling threaten to take commerce out of the hands of private traders, placing it in the uninspired care of bureaucratic negotiators.

Our government has taken the lead in calling the conference of 18 nations, now meeting at Geneva, to open as many trade doors as possible. The American delegates will bargain product by product and country by country—all summer, if necessary—for lower tariffs, fewer quotas and a free flow of *private* trade. The task is a long one, and the results are as yet uncertain, but, if success is achieved, an immense opportunity for good works and good earnings will lie before American businessmen.

This is no picayunish opportunity. Authoritative estimates put our 1947 exports at $11 billion and our imports at $6 billion. That's substantial. It is greater than the value of all crops grown on our farms ($10½ billion) and exceeds the value of all shipments of industries such as automobiles ($9 billion), textiles ($8 billion) and chemicals ($8 billion).

International trade is vital, not to be shrugged off, not to be kicked around as a football of party politics. Republicans and Democrats agree on a non-partisan foreign *political* policy. They should agree also on a non-partisan foreign *economic* policy. The foreign relations of the United States, political or economic, can no longer be log-rolled hither and yon.

A general program for international recovery, outlined here, will bring its full quota of aches and pains. But lack of a program will produce economic and political troubles on a vast scale; timid retreat will invite economic disaster and war.

By an intelligent, bold and resourceful program, we have a chance to win through to a long peace in the kind of world we want. *Unless America provides the leadership, there can be no such program.* Then Communism merely needs to hang around long enough to pick up the pieces.

Ours is the responsibility and the opportunity.

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A NEW ENTERPRISE

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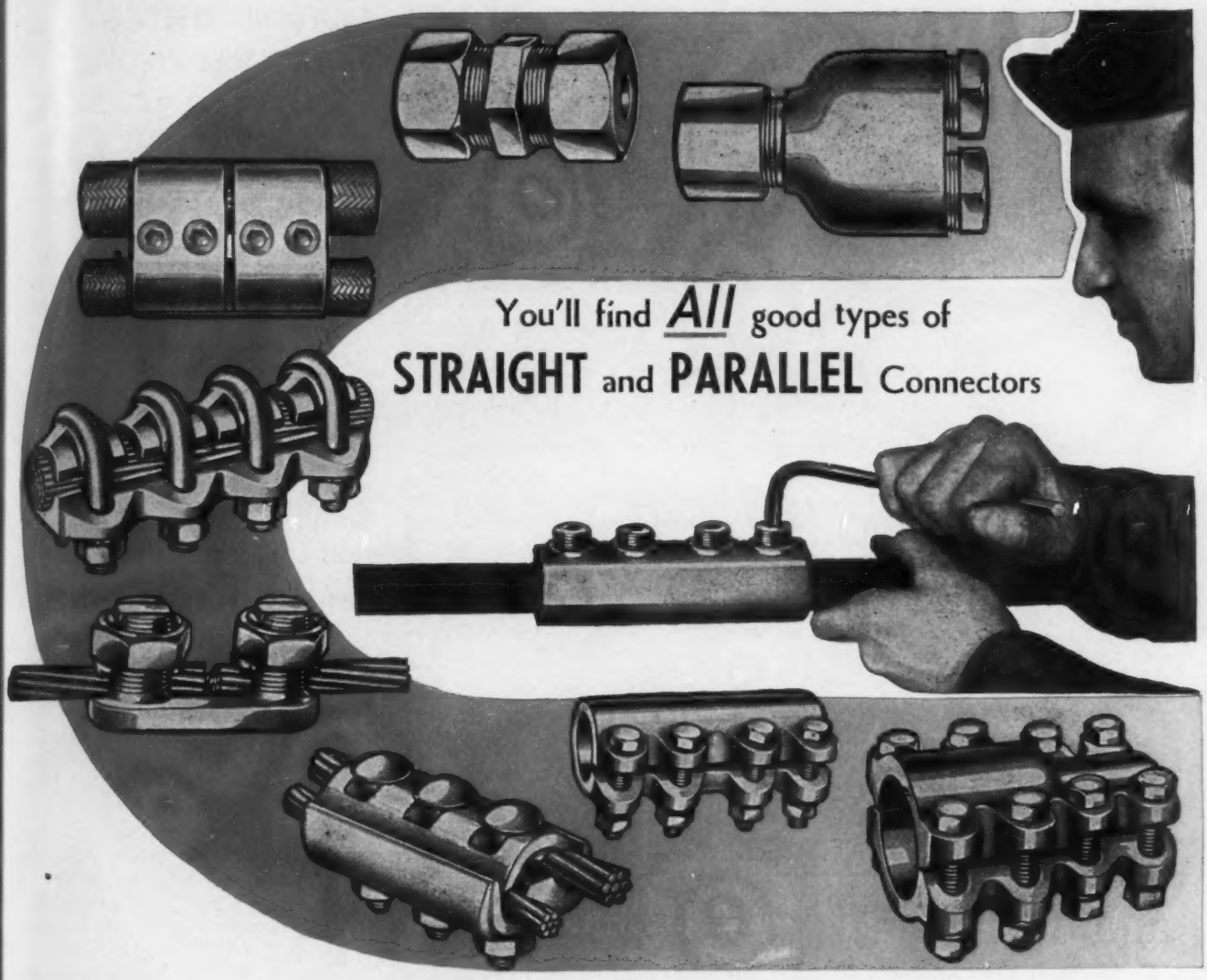

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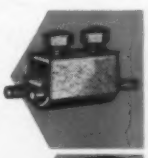

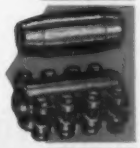

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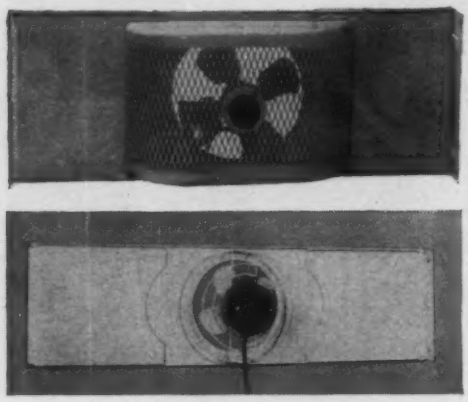

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CALIFORNIA ELECTRIC STOCK ISSUE APPROVED

FPC has authorized California Electric Power Co., Riverside, Calif., to issue 80,000 shares of cumulative preferred stock, par value $50 a share, and to sell such stock through competitive bidding, subject to subsequent commission approval of the cost of money to the company and the offering price to the public. Purpose of the issue is to secure funds for development and expansion of company facilities and to liquidate certain short-term borrowings totaling $1,500,000. Total expenses in connection with the proposed issue are estimated at $40,000, plus an undetermined amount for accrued dividends.

Trust Company Summoned in Pepco Reorganization Plan

Following rejection of the Portland Electric Power Co. reorganization (EWEST June p. 136), Guaranty Trust Co. of New York and its vice-president, Henry A. Theis, were cited to appear in federal court at Portland July 8 and show cause why they should not be punished for contempt of court. The order is an outgrowth of a letter to Pepco bondholders in connection with reorganization plans which had been approved by Judge James Alger Fee. According to affidavits presented to the court by R. L. Clark and Thomas W. Delzell, independent trustees for the company, the letter included misleading statements.

● PUD No. 1 of Clallam County at Port Angeles, Wash., has applied to the FPC for permission to develop a power site at Oxbow Bend on the Hoh River in adjacent Jefferson County on Washington's Olympic Peninsula. Because of opposition from fishing interests, a public hearing will be held some time this summer. Henry Gray, Seattle consulting engineer, is engineer for the $5,000,000 project. Sedric Payette, manager, said. Plans call for 2,000-kva. capacity.

● WASHINGTON state board of conservation and development has authorized the City of Tacoma to proceed with surveys of two hydroelectric dam sites on the Cowlitz River at Mossyrock and Shut-In to determine their economic and engineering feasibility. The authorization remains in effect for three years and can be extended for an additional two years with approval of the governor. Progress reports are required every 30 days and a complete report at conclusion of the work.

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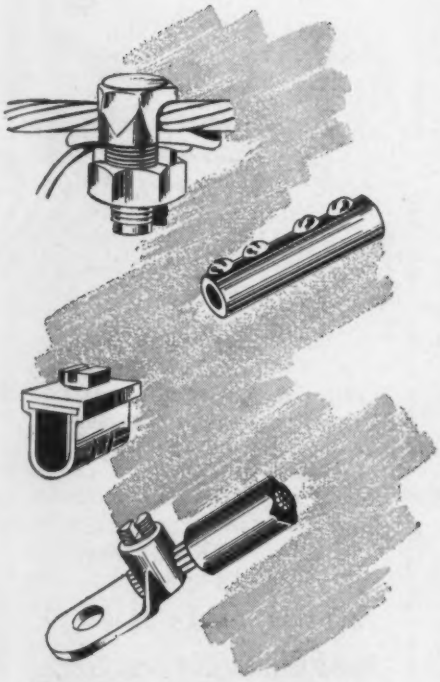

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NEVADA BIDS FOR SHASTA DAM POWER

Application from the State of Nevada for purchase of a block of Shasta Dam power has been received by USBR Regional Director Richard L. Boke at Sacramento. Boke said that negotiations are under way for a contract with the Nevada Colorado River Commission, an official body charged with general authority over Nevada's water and power resources.

He stated that Ben W. Creim, regional power manager for the bureau, and his assistant, J. P. Elmore, have met with Governor Vail Pittman and members of the Nevada commission, and that Creim is initiating engineering studies preparatory to drawing up a contract for the commission's consideration. Governor Pittman is chairman of the commission.

Colorado Utility Tells Expansion Plans

Definite plans for expansion of Southern Colorado Power Co. were disclosed by W. N. Clark, president, in his annual report to stockholders. Three years is the time set for completion of the program; and three and one-half million dollars the amount to be invested in improvements and new plants.

Eastern industry moving westward has filed many applications for power, Clark said, in addition to already established firms needing more enegry.

Funds for the power company's program will derive from three sources, Clark asserted: one million dollars from reserves, another million from bank borrowings or sale of stock, and the rest from estimated revenues. In contemplation are two additional operating units which may be installed at Canon City or Rocky Ford, Colo.

Fairbanks, Alaska, May Build Utilities System

Following approval by the voters of a $4,000,000 bond issue, Fairbanks, Alaska, is considering the feasibility of building a public utilities system of water, telephone, heat and power for Fairbanks and adjacent communities.

The voters denied new 20-year franchises to the Northern Commercial Co., which has been furnishing power, water and heat, and to the Fairbanks Telephone Co. Existing franchises expire in three years.

The Northern Commercial Co. provides city-wide electric service, with water, steam and heat in the business district only.

BANDON TO RECEIVE BPA POWER ON 20-YEAR CONTRACT

Bonneville Power Administration has signed a 20-year contract to provide electricity to Bandon, Ore., routing power to the city via the Mountain States Power Co. BPA refused a Bandon application in 1940 because at that time the town was too remote from its transmission system.

Power wheeling by Mountain States was agreed to when the utility signed a contract with Bonneville for power to be used in its upper Willamette Valley operations. Bandon previously had purchased about half its supply from Mountain States. Administrator Paul Raver said BPA will give the southern Oregon city direct service when the Coos Bay area power supply is reinforced by construction of the proposed Eugene-Coos Bay transmission line.

Ellensburg Planning to Operate Plant Again

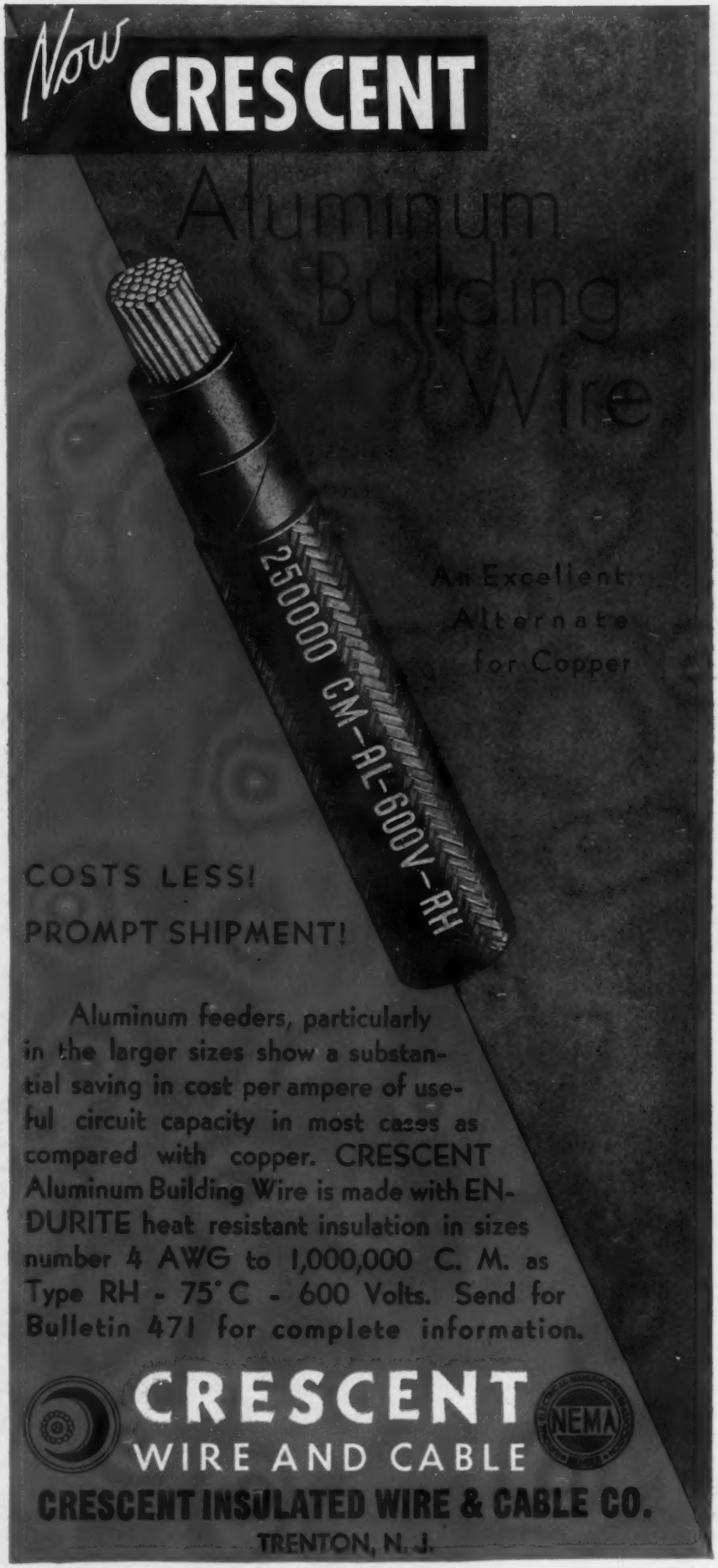
With appointment of George Minton as chief operator, the Ellensburg, Wash., municipal light department was expected to put its hydroelectric plant back into operation June 15, according to Superintendent Lewis Ambrose.

The plant had been closed since May 14, when the four-man crew joined ground and line crews in a walkout over a wage dispute. Minton was chief operator at the plant several years ago, before moving to Seattle.

During closure of the plant, the city had been buying all its power from the Bonneville Power Administration.

Four employees of the light department have been rehired at an increase of $25 a month, Ambrose said. The increase was the same they previously had been offered but the men quit when the city council refused to grant the same increase to hydroelectric plant operators.

● FOLLOWING the announcement of plans to proceed with a second generating unit at Bridge River, comes news that B. C. Electric has given orders to commence work on the La-Joie Falls storage dam some 40 miles upstream from the diversion dam presently under construction. Purpose of the dam will be to control the flow of Bridge River and to create a storage lake covering some 12 sq. mi. in area. This dam will be equipped with two diversion tunnels, 14 ft. in diameter, which will in turn control the flow of water to the down-stream plant. The dam will also be equipped with a spillway to release flood waters in excess of storage capability.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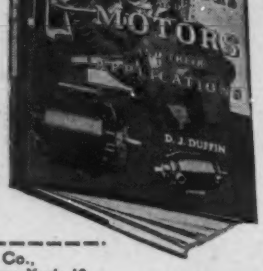

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NOTES ON THE TRADE

General Electric Ready to Build San Jose Factory

General Electric has announced that immediate plans are under way for the construction of its $2,000,000 plant at San Jose. It is believed that the new factory, which will cover over a hundred thousand square feet, will be ready within a year. Leland S. Rosener, San Francisco engineer, is drawing up the plans.

The new plant will manufacture both polyphase and single-phase motors, and will employ approximately 300 persons in addition to those now working for G-E at San Jose. The leased G-E plant on Alum Rock Ave. will continue until all motor operations can be integrated. Planned operations will allow the expansion of transformer manufacturing in Oakland.

General Electric's total West Coast apparatus manufacturing will be centered in the Bay Area when these plans become effective. The three distinct units involved are the E. 14th St. Oakland plant for transformers; the cable and fluorescent ballast plant on 69th Ave. in Oakland; the San Jose motor operations. John Hood is manager of the G-E Oakland Works, which includes San Jose operations.

● NELSON ELECTRIC Corp. has recently purchased the A. L. Nelson & Co., West Coast manufacturers of radio transformers. This newly formed corporation, located at 1620 Euclid St., Santa Monica, Calif., will be headed by A. L. Nelson. The firm will continue to manufacture radio and small industrial types of transformers. Emphasis is to be placed on expansion toward heavier industrial transformers for public utilities and industrial plants. Nelson, founder of the corporation, has in the past served with RCA, Farnsworth Television and Radio Corp. and Aircraft Accessories Corp. He holds a number of patents on ultra-high frequency circuits.

● ALEX HIBBARD Co., Denver welding equipment dealer, was recently made a distributor for Nelson Stud Welding Corp. This distributorship will cover Colorado, Utah, Wyoming, and parts of Idaho and Montana.

● MOTOROLA, Inc., 4545 Augusta Blvd., Chicago, Ill., is the new corporate name of Galvin Manufacturing Corp.

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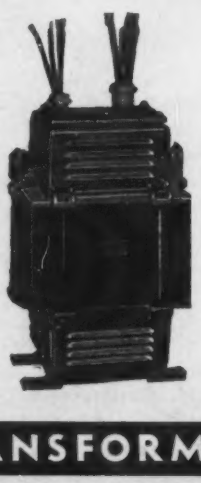

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When you are installing or re-arranging—and need a special transformer to exactly match your requirements—call on us. We can deliver in a week to 10 days.

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Three Complete Warehouse Locations!

Cole Electric Mfg. Co. has opened a new plant in Culver City, Calif., for manufacture of high-voltage disconnect and air brake switches. Cole was organized seven years ago by F. H. Cole; Culver City address is 8439 Steller Dr.

● LEE ARTER, assistant sales manager of the Rittenhouse Co., has announced the opening of his own company in Los Angeles. He will be a manufacturers' representative, specializing in houseware lines, and will cover the states of California, Nevada and Arizona. Headquarters will be at 122 E. Seventh St., Los Angeles 14. An office will be opened in San Francisco.

● JOHN B. BANKS, northwest regional manager for Minneapolis-Honeywell Regulator Co., has announced the opening of a company office in Butte. James A. Reynolds, a native of Montana, has been transferred from the Seattle office to Butte as branch manager. The Butte office will serve Helena, Missoula, Bozeman, Anaconda, Cut Bank and Shelby.

● MINNEAPOLIS - HONEYWELL Regulator Co. has opened a branch office at Fresno, Calif. to serve the San Joaquin Valley area. Temporary quarters are at 1357 N. St. Clyde N. Bradley, until recently in the San Francisco office of Honeywell, has been appointed district representative for the company, according to C. L. Peterson, Pacific regional manager.

● CHARLES FLETCHER, formerly of Portland, has purchased the Spokane branch of the Huletz Electric Co., S. 121 Monroe St., from Edward Huletz of Seattle. The firm will be renamed the Fletcher Electric company, it is understood, and all kinds of electrical appliances will continue to be distributed.

● BAILEY METER Co. has assigned R. L. Stewart to Denver as field engineer. Stewart served in the Navy during the war and recently was graduated from a training course at the company's Cleveland factory.

● APPOINTMENT of ALLEN W. WEXLER as sales manager of the Pacific Coast district for Noma Electric Corp., in charge of toys, decorative lighting, novelties, heaters, wire and cable, was announced by Joseph H. Ward, executive vice-president. Wexler's headquarters will be in Los Angeles.

● ROBERT WELKER, formerly production manager for Pacific Electronics of Los Gatos, Calif., has been appointed to a similar post on the staff of General Electronics, Inc., of Paterson, N. J.

● DONALD S. GLEASON of Seattle will represent Bright Light Reflector Co. in Idaho, Oregon and Washington.

ALL the strength and durability inherent in steel are combined—with definite economies—in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

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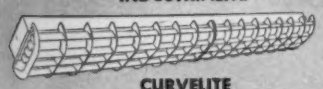

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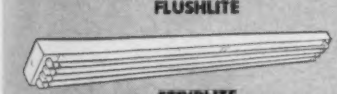

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NEWS ABOUT PEOPLE

● APPOINTMENT OF T. E. ROACH as vice-president and general manager of the Idaho Power Co. was announced in Boise last month following a meeting of the company's board of directors, by C. J. Strike, company president. Strike said that Roach will be in charge of company operations while he himself devotes his time to the expansion program. Roach has been vice-president and general manager of Northwestern Electric Co. at Portland since 1942, previous to that was chief executive of the Washington Gas & Electric Co. at Tacoma, Wash. He and Strike were associated in the management of the Northwestern Public Service Co. at Huron, S. D., in 1923 and 1924.

● JOHN DIERDORFF, advertising supervisor of the Pacific Power & Light Co., has been elected a vice-president of the utility by the board of directors. Responsibilities of his new position will include general supervision of the company's advertising and publications. He has been with Pacific and its affiliates since 1933. Since his graduation from the University of Oregon in 1922, he has been engaged in newspaper, advertising and publicity work. His headquarters will be at Portland.

● L. E. KARRER, vice-president of Puget Sound Power & Light Co. since 1942, has been promoted to executive vice-president, Frank McLaughlin, president, announced. The post had been vacant since the retirement of Samuel P. MacFadden more than a year ago. Karrer was graduated from the University of Washington with a bachelor of science degree in electrical engineering and joined Puget Power in 1927 as a meter tester. He worked successively through various positions of increasing responsibility, including student engineer, assistant engineer, assistant to the vice-president and manager of the subsidiary North Coast Transportation Co.

● CHARLES W. ALLISON, formerly chief operating clerk, has been appointed assistant to the vice-president of the Puget Sound Power & Light Co. He replaces the late Henry B. Hardin. Allison joined the company 30 years ago as a substation operator and worked up as chief substation operator, chief clerk and special operator in the central division. He later transferred to the light and power department as chief clerk and became chief operating clerk in 1941.

Roach

Dierdorff

Karrer

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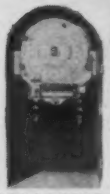

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George H. Curtiss, 222 29th St., Oakland 11. Veale Elec. Equip. Co., 445 E. 3rd Street, Los Angeles 13. Abbott Elec. Co., 1101 Eastlake Ave., Seattle 9. Stevens Sales Co., P. O. Box 2338, Salt Lake City 14. H. George Shefler, P. O. Box 1587, Phoenix.

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ROCHESTER 1, NEW YORK

NUMERICAL Topflight Tape

FOR WIRE IDENTIFICATION

TOPFLIGHT TAPE CO. YORK, PA.

Nolan

● S. R. MAY has been named sales promotion manager of the Los Angeles branch, Westinghouse Electric Supply Co. Since 1936 May has been with Wesco, first as shipping clerk in the appliance division at Mansfield, Ohio, and later working in the advertising department. In 1945 he joined Wesco in Los Angeles and until his recent appointment has been handling sales promotion work under T. B. Kalbfus.

Field

● THREE Hawaiian Electric Co. men have been advanced to vice-presidencies. They are C. J. SCHIFFERS, elected vice-president, industrial relations manager and assistant secretary; HARRY P. FIELD, vice-president and commercial manager; CHARLES E. NOLAN, vice-president and promotional manager.

● ROBERT W. DIAMOND of Trail, B. C., general manager of the Consolidated Mining and Smelting Co., has been elected president of the West Kootenay Power & Light Co. to succeed the late L. A. Campbell. A. L. JOHANNSON has been elected a director and vice-president of the company.

Schiffers

● WILL H. DAVIE, president of Allied Industries, Alhambra, Calif., retired July 1, following 57 years in the electrical industry. He came to the Pacific Coast in 1909 with Johns-Manville and in 1919 formed Allied Industries, manufacturers' agency operating up and down the coast. Davie will continue as chairman of the board. R. W. Brown, with Allied Industries for 24 years and most recently Los Angeles district manager, becomes president. R. B. Campbell, secretary, takes on the added responsibilities of treasurer.

● PHILIP MCGARVIE has been appointed manager of the Vancouver, B. C. branch of the Canadian Fairbanks-Morse Co. Ltd. For the past ten years he has been manager of the Edmonton branch of the company.

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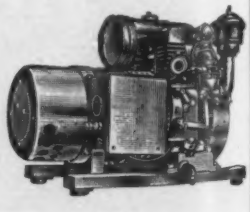

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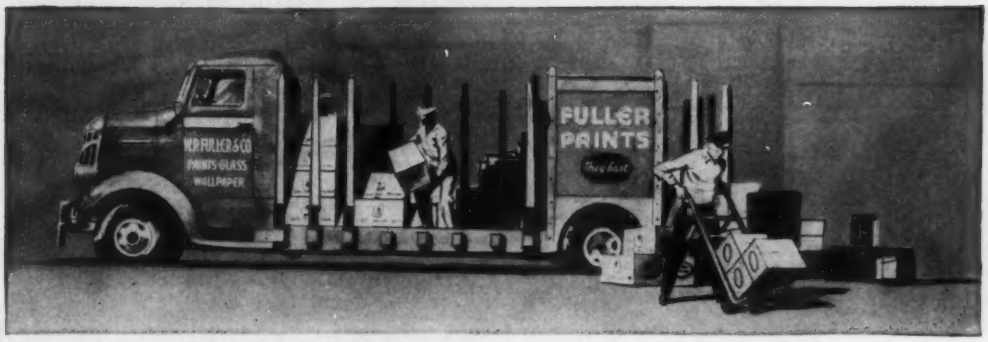

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FULLER FINISHES

● WESTERN REGIONAL chairmen and vice-chairmen for the Second International Lighting Exposition and Conference to be held in Chicago Nov. 3-7 are: Los Angeles, M. J. Rudman, the Miller Co., chairman, Harold Pomeroy, Wheeler Reflector Co., vice-chairman; San Francisco, C. O. Martin, Benjamin Electric Mfg. Co., chairman, J. P. Wade, General Electric Supply, vice-chairman; Salt Lake City, W. E. Gnadt, Mitchell Mfg. Co., chairman, J. R. Christensen, Mitchell Mfg. Co., vice-chairman. These men will encourage conference attendance and entries to the Merit Award Competition.

● L. E. BROWN, special representative of the Westinghouse Electric Corp., Salt Lake City, retired June 1 after 51 years of service. He has been working for the company in Salt Lake City since 1912, and became manager of the Salt Lake office in 1931. In 1941, because of his wide experience with electrical mining equipment, he was made special representative to the entire Western mining industry.

● THE WESTINGHOUSE "Order of Merit" was awar led to JOHN J. HAYES of San Francisco, manager of the treasury department for the company's Pacific Coast district. Presentation was by Charles A. Dostal, vice-president in charge of sales for the district, at the annual district managers' meeting in Big Basin, Calif.

Fisher

● R. E. FISHER, who retired July 1 as vice-president in charge of public relations and sales of Pacific Gas and Electric Co. after 36 years with that utility, has opened an office in the Merchants Exchange Building, San Francisco. In addition to serving as chairman of the Bay Area Council, he has announced that he is prepared to accept a few assignments of a public relations, business and civic development nature.

● JOSEPH R. WELLS has been transferred to Yakima, Wash., to head the new branch office of the Westinghouse Electric Supply Co. Wells was formerly branch manager of Westinghouse in Tacoma, Wash., and will be succeeded there by EARL MCBRATNEY, who has just completed a year's schooling at the Pittsburgh headquarters.

● J. H. BURRUS was recently appointed assistant manager of the Portland district office of Allis-Chalmers. Burrus has been with the firm since his graduation from Texas A & M College in 1937. Before coming to Portland, he was associated with the Allis-Chalmers North Carolina office.

● RHEEM Mfg. has announced the appointment of REESE B. LLOYD as manager of its Western plants, with headquarters in Los Angeles. Lloyd joined the company in 1944 as production manager of the Chicago plant, and for the past year has managed the larger of the two Rheem plants in Chicago.

● JOHN PARKS, attorney, has been appointed chairman of the Hawaii Public Utilities Commission. He succeeds VALENTINE B. LIBBEY, construction engineer. Members of the commission include: James M. O'Dowda, Leo Lycurgus, Manuel Aguiar, Fred G. Manary and John Parks.

Colorado Line Crew Wins Valor Award

The Claude L. Matthews Valor Award was presented to a 12-man crew of Public Service Co. of Colorado linemen for service "beyond the reasonable demands of duty" during a blizzard on Hageman Pass in January 1946. To avert destruction of an isolated section of a major 110,000-volt transmission circuit, the party traveled over 12 miles of extremely perilous patrol paths and shelf road to the 12,200-ft. pass. For eight days and nights they maintained themselves in emergency cabins while temporary repairs were made to three badly buckled steel towers. Winds of cyclonic velocity, 30° below zero weather, extreme ice loads on conductors and a minimum of equipment to work with, combined to make the job one calling for the ultimate in courage and resourcefulness, the awards committee said.

The $150 prize and valor pins were awarded by Claude L. Matthews at the EEI convention in Atlantic City on June 4. In the crew were E. V. Stuart, line superintendent; Eldin G. Larsen, assistant line superintendent; Glen C. Farnsworth, Sam C. Phillips, A. J. Lunsden, E. D. O'Connor, Ernie Richey, E. L. Noland, G. E. Atkinson, T. G. Johnson, Harry O. McIntosh and S. M. Stroebeck.

Left to right: W. D. Hardaway, superintendent hydro and transmission; C. C. Farnsworth, transmission engineer; Ernie Richey, line foreman; T. C. Johnson, lineman; Sam Phillips, patrolman; G. E. Atkinson, lineman; President J. E. Loiseau; E. C. Larsen, assistant superintendent lines department; Sherman Stroebeck, driver; E. L. Noland, lineman; E. V. Stuart, superintendent transmission; A. J. Lumsden, line patrolman; F. F. McCammon, vice-president

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IS THE FINEST HEAVY DUTY OIL EVER DEVELOPED?

Because it is an entirely new kind of heavy duty Diesel lubricating oil... non-corrosive ...with unheard of resistance to the "inside" causes of oil breakdown and reduced engine life

The tests used in proving new-formula Shell Talona Oil are the stiffest ever devised. Yet Talona passed every single test by so wide a margin that it literally created a new oil *class* for itself!

Talona kept sludge to a harmless minimum; protected copper-lead alloy bearings from any trace of corrosion; kept pistons and rings virtually free of carbon and lacquer deposits. As for wear resistance — imagine this: wear to pistons and cylinder walls was actually too small to be measured by ordinary standards. *Piston rings still showed original toolmarks.*

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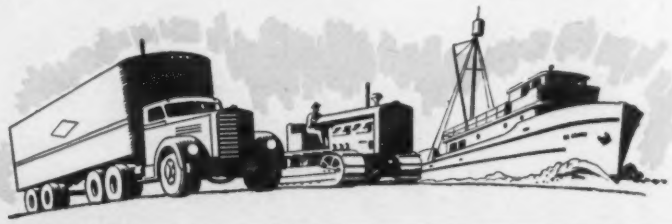
If you agree that your high speed Diesel and heavy duty gasoline engines deserve the best there is in lubrication — switch to Talona. This great oil will help such engines operate longer at sustained efficiency. Fuel economy should improve. And with good care of air cleaners and oil filters, periods between overhauls should be lengthened. Talona Oil is available only from Shell Oil Company, *Incorporated.*



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PROFILES

A gavel from the Rochester chapter was presented Chairman Gene Fleming of the new Utah Chapter, IES, by James Ketch, Nela Park, representing President Hardacre of IES. (Above). Quiet moment between PCEA sessions enjoyed by Lee Brillhart PG and E, and Ed Wright, San Diego G&E, both chairmen of Administrative Services group meetings at the convention. Beaming like the sun were these Sunbeam men, at the PCEA convention. Charles Moore, Pacific Coast manager, B. A. Graham, president of Sunbeam Corp., Chicago and convention speaker, Major E. W. Moore, pioneer with the line, and H. E. Sandoval, San Francisco district manager. Small appliances are major load builders, Graham contended; gave figures as proof

Footnotes* ...to the California Scene

SCENE 5: Let's Talk Turkey About FARMING

California farms earn the highest per capita income of any in the U. S. In 1946, their income was **over $2 billion.** Turkey raising is one of many profitable types of farming. In addition, our farms account for half the nation's fruit and a fourth of its vegetables. With food a premium coin in global political bargaining, California farming becomes more important than ever.*

**Behind this amazing record is the fact that over 90% of Northern California farms are electrified and service is on the way to those few remaining. They consume as much electric power as all other farms in the nation combined. P. G. and E. is one of the pioneers of U. S. rural electrification and has a real interest in helping Northern California farmers obtain bigger and better crops through use of modern methods.*

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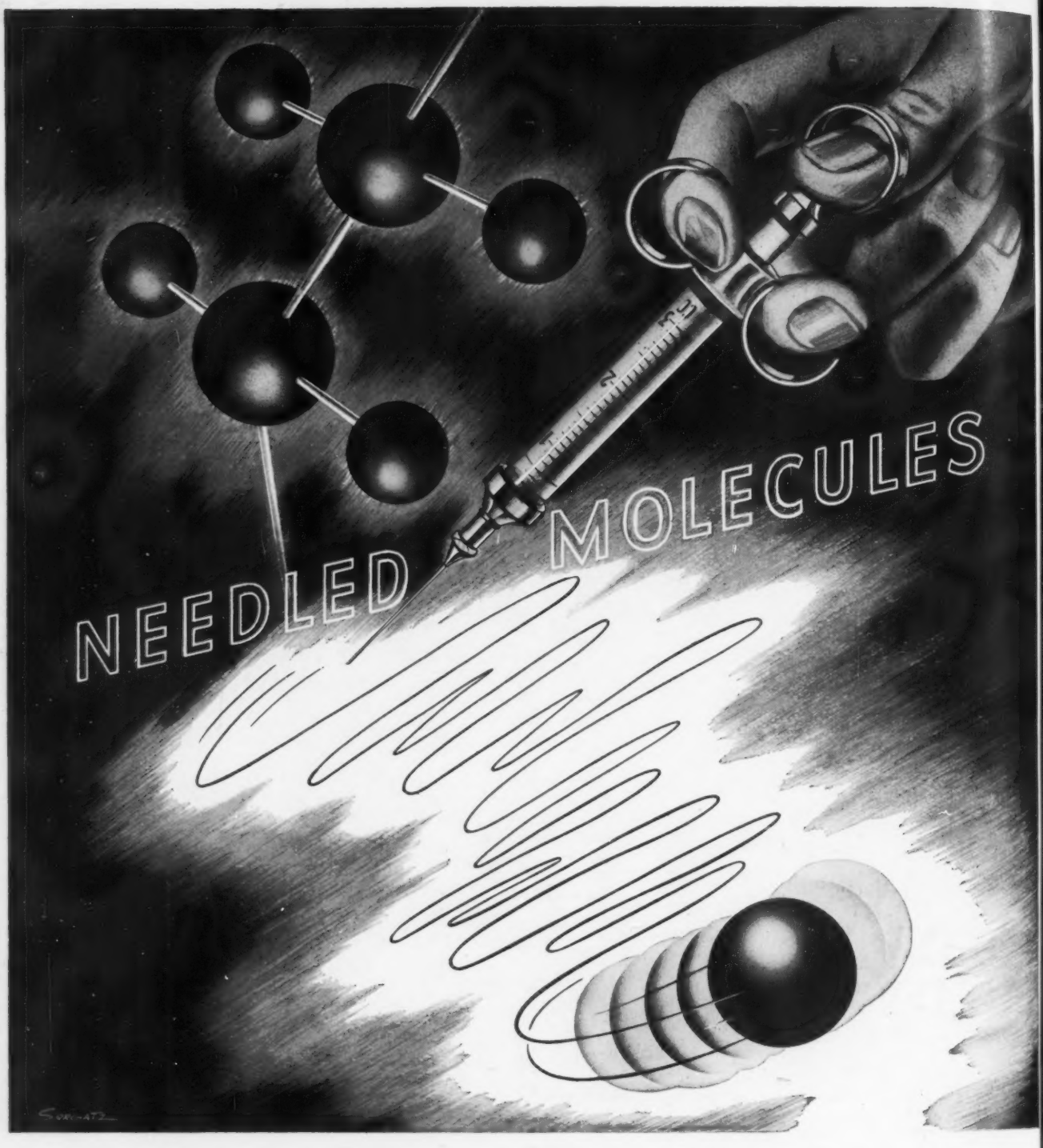

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Watch this page month by month for latest developments. See your local utility engineers for details of equipment, application and the market.

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